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**GOOD PRACTICES IN CENTRAL ASIA AND THE EU
ON COLLABORATION BETWEEN BUSINESS
AND HIGHER EDUCATION AND VET INSTITUTIONS
TO STRENGTHEN EMPLOYABILITY OF GRADUATES**

Review Report



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Table of Contents

1 EXECUTIVE SUMMARY	3
2 INTRODUCTION	6
2.1 Context and Objectives of the Study	6
2.2 Definition of Cooperation Schemes between Business and Education	7
2.2.1 Cooperation Schemes between HEIs and Business	8
2.2.2 Cooperation Schemes between VET Institutions and Business	11
2.2.3 Cooperation Schemes between HEIs and VET Institutions	13
3 BACKGROUND OF COOPERATION SCHEMES BETWEEN BUSINESS AND EDUCATION	15
3.1 Policies and Frameworks in the EU	15
3.2 Policies and Frameworks in Central Asia	19
3.2.1 Kazakhstan	20
3.2.2 Kyrgyzstan	22
3.2.3 Tajikistan	23
3.2.4 Turkmenistan	24
3.2.5 Uzbekistan	25
4 GOOD PRACTICE FOR EXISTING COOPERATION SCHEMES	28
4.1 Existing programmes	28
4.2 Examples from the EU	33
4.2.1 Corporate Partners Club at the Warsaw School of Economics	33
4.2.2 North American Studies at the University of Economics in Bratislava	34
4.2.3 Team Academy at the Jyväskylä University of Applied Sciences	36
4.2.4 Strategic R&D Cooperation in Latvian Glass Industry	38
4.2.5 Center for Innovative Craftsmanship Techwise Twente	40
4.2.6 Coop Food School	41
4.2.7 Work-based Learning in Bosch	42
4.2.8 VET in HARIBO	45
4.2.9 Volkswagen Dual Academy	48
4.2.10 L'Atelier Tuffery - Lycée Jean-Baptiste Dumas d'Alès	49
4.2.11 ABB Training Center GmbH & Co. KG	51
4.2.12 ELA – Polish Graduate Tracking System	52
4.2.13 Baden-Wuerttemberg Cooperative State University	54
4.3 Examples from the Central Asia	55
4.3.1 Nazarbayev University Innovation System	55
4.3.2 UNIWORK – Strengthening Career Centres in Central Asian HEIs	56
4.3.3 Turin Polytechnic University in Tashkent	58
4.3.4 Enterprise-based Learning in Eastern Kazakhstan	60
4.3.5 Huawei Seeds for the Future Programme	61
4.3.6 Mirzo Ulugbek Innovation Center	62

4.3.7 Business Forum of Uzbekistan – Start-up Support	63
4.3.8 Westminster International University in Tashkent	64
4.3.9 Adam University in Bishkek	67
4.3.10 Avicenna Tajik State Medical University	69
4.3.11 Professional Services Lyceum in Khujand	70
4.3.12 Partnership of a College and Mining Industry in Kostanay Region	71
4.3.13 Tashkent Chemical Technology Institute	72
5 CHALLENGES FOR IMPLEMENTATION	74
6 RECOMMENDATIONS	76

1 Executive Summary

Ministerial Meetings of Ministers of Education in Riga (2015) and in Astana (2017) outlined several priority fields of activity for CAEP II. One of them is 'enhancing employability of HE and VET graduates' which is reviewed in this study through the selected good practices for existing cooperation models and institutional arrangements between business and HE and VET institutions in the EU and Central Asia countries. The study identified the most frequent forms of cooperation among enterprises and educational institutions and illustrated on selected case studies from the EU Member States and countries of Central Asia. These forms are highly complementary and usually do not occur separately, in one form only.

Research cooperation is considered the most common and the most important form of cooperation between HEIs and business entities. An excellent European example is the cooperation between the Solid State Physics Institute (SSPI) of the University of Latvia and the GroGlass, a leading Latvian company in developing and manufacturing anti-reflective and other high-performance coatings on glass. The SSPI is providing highly specific and professional analysis and product tests for GroGlass, which in return provides University's researchers, scientists, and students opportunities to improve their professional skills and competencies via in-company practice and training.

A unique example from Central Asia represents the Turin Polytechnic University in Tashkent (TPUT), founded as a cooperation project of Politecnico di Torino (POLITO, the oldest Italian technical university), UZAVTOSANOAT (the leading automotive group in Uzbekistan), General Motors and the Uzbek Ministry of Higher Education. TPUT aims to train qualified engineers in Uzbekistan and to conduct research and development at international level and to support Uzbek industrial development through the creation of entrepreneurial capabilities and the supply of facilities for industrial innovation.

Valorisation of cooperation aims on commercialisation of the research results and is usually a natural result of a research cooperation. However, valorisation also comes in the form academic or student entrepreneurship. Truly unique example of student entrepreneurship in Europe is the study programme Team Academy at the Jyväskylä University of Applied Sciences, Finland. During the first year of study, students gain a basic economic education, including management, leadership, marketing, etc. After the first year of the undergraduate business economy, they have to develop a real business which will generate money. In a real-life business environment, students learn finance, marketing, leadership and business strategy by working on real projects from organizing events to running retail outlets.

An interesting example from Central Asia is the Mirzo Ulugbek Innovation Center, established in accordance with the Decree of the President of Uzbekistan of June 30, 2017. The main goal of the Innovation Center is to create favourable conditions for the formation and active development of high-tech industries based on the use of ICT and further deepening of the integration of science, education and production in this industry.

Education institutions from both HE and VET sector often cooperate with partners from business sector in the field of **education**. This cooperation has a form of development of curricula or the whole study programmes, or varieties of work-based learning opportunities. An example from Europe represents the study programme of the Center for North American Studies (CNAS) of the

University of Economics in Bratislava, Slovakia. CNAS offers to its students more than 10 accredited elective courses, developed and taught in English by representatives from global private companies, such as Lenovo, DELL, AT&T, Amazon.

A good example how the dual system is implemented in remote regions of the country can be found in Ust-Kamenogorsk, an important mining and metallurgical centre of Kazakhstan. The cooperation among the energy producer AES Kilroot Power Ltd., D. Serikbayev East Kazakhstan State Technical University and Ust-Kamenogorsk Polytechnical College, supported by the develoPPP.de programme of the German Federal Ministry for Economic Cooperation and Development, aims to align training in the areas of energy efficiency and workplace safety with the needs of Kazakhstan's mining and metalworking industry and other sectors of the economy.

Cooperation at a management level can either have the form of joint governance or shared resources, and as in previous case it is usually a common form of cooperation in both HE and VET. An interesting example from Europe represents the SGH Warsaw School of Economics and its Corporate Partners Club, joining prestigious circle of companies supporting development of the University and connection between business practice and theory. One of the forms of cooperation is support and investment in the development of University's infrastructure, such as lecture rooms or the Undergraduate Studies Office.

Example from Central Asia represents the Professional Services Lyceum (PSL) in Khujand, Tajikistan, providing a practical training of young people in collaboration with local employers. Besides other forms of cooperation, a company CJSC "Avtoservis" fully equipped one classroom of PSL, in which the master classes for teachers and students are organized by specialists from this company.

Career counselling and alumni work include a wide range of services and instruments promoting employability of students and enhancing the quality of education. Besides other forms of cooperation in the education, Bosch Germany provides a special programme for students enrolled in study fields of mathematics, technology and/or computer science who completed internship or practice at Bosch. Each student within the "Students@bosch" programme has its own mentor from a relevant department who gives him/her valuable career tips and has an opportunity to attend various training courses and seminars that significantly increase his/her knowledge and skills.

A significant help for students in finding a suitable career path provides the project UNIWORK – Strengthening Career Centres in Central Asian HEIs. Based on the know-how and experience of Spanish, British and Austrian universities, the UNIWORK project enhanced the capacities of selected HEIs in all five Central Asia countries in effectively promoting the employability of graduates and entrepreneurship culture among students.

Case studies from Europe and Central Asia presented in this report revealed a number of **challenges** for further enhancement of the cooperation between education and business. In addition to that, many issues summarised below have been raised and discussed by the participants of the CAEP regional conference "Enhancing cooperation between employers and education institutions in Higher Education and Vocational Education and Training in the European Union and Central Asia countries" held in March 2018 in Warsaw.

At the **government level**, the major challenges include (i) the lack of systemic motivation, support and initiatives from relevant ministries, and (ii) limited interest/political power to change the environment at HEIs and colleges, particularly the lack of openness to new ideas, concepts, and/or teaching and training methods.

In addition to that, still too many challenges to further development of the cooperation with employers can be found within the **educational institutions**. Many of them do not follow and understand the changing needs of the business world and thus do not adapt their educational programmes and research capacities to their requirements. Among the usual weaknesses in this sector belong: (i) lack of internal mechanisms enabling and rewarding the cooperation with

business; (ii) lack of openness and transparency (in terms of educational programmes and their objectives, research topics and results, ongoing projects) of educational institutions towards employers; (iii) problems in finding the right, experienced and skilled educators, coaches and/or trainers; (iv) lack of experience and/or drive for commercialization of research results; (v) insufficient geographical and research proximity of educational institutions with companies willing to cooperate; (vi) insufficient motivation of students to undergo an enterprise-based training; (vii) lack of quality education, poor expertise among the teaching and research staff and weak reputation of the educational institution; (viii) limited offer of entrepreneurship courses or internships in the country or region; (ix) insufficient career counselling services at HEIs and VET institutions; (x) insufficient tracing of graduates' careers which causes missing information on labour market relevance of the study programmes.

The study revealed that representatives of the **business community** often underestimate the cooperation potential with educational institutions and do not actively seek and create collaboration opportunities. They are used to work in a more flexible way than educational institutions and sometimes do not want to face administrative burdens and routine time-consuming procedures.

Identified challenges allowed to formulate several recommendations for stakeholders and decision-makers in Europe and Central Asia. **Governments** of all countries are advised to pursue their facilitator role in the cooperation between educational institutions and employers, in particular by: (i) creating enabling legal environment; (ii) involving in relevant informational platforms and fora; (iii) provision of sufficient funding; (iv) supporting internationalisation of HEIs and colleges; (v) delegating maximum degree of freedom, flexibility and responsibility to educational institutions; (vi) rewarding the results of quality education; (vii) increasing attractiveness of VET; and (viii) collecting and publishing statistical data on education and its labour market relevance.

Educational institutions are encouraged to comply with basic preconditions for their potential cooperation with enterprises. This includes: (i) enabling internal procedures for cooperation with business; (ii) creating sufficient motivation for teachers and researchers who already cooperate with business; (iii) fostering culture of openness and welcome for partners from the business sector; (iv) attracting highly skilled staff members with previous experience in business; (v) providing high quality education and research; (vi) actively seeking partnerships with business sector; (vii) establishing supporting structures for research funding and its results' commercialisation; (viii) using existing internationalisation opportunities; (ix) provision of interdisciplinary entrepreneurship courses and trainings for students; (x) provision of professional career counselling services; (xi) application of graduate tracer study mechanisms and alumni work.

Finally, **employers** should actively exploit the potential of cooperation with HEIs and VET institutions in their geographic and sectoral proximity by: (i) participating in legislative and policy making processes through their unions and associations; (ii) investing into the dual education programmes with both HEIs and VET institutions; (iii) clearly formulation and presentation of their needs and expectations towards future graduates; (iv) active approaching of education institutions with research issues, training requests and offers as well as corporate social responsibility activities.

2 Introduction

2.1 Context and Objectives of the Study

In 2007, the European Union launched the *EU Central Asian Strategy for New Partnership* in order to support various cooperation priorities, such as education. One of the agreed political and thematic dialogue was the *Central Asia Education Platform (CAEP)* focusing on the two main components of education systems: (i) vocational education and training (VET); (ii) higher education (HE).

The CAEP is consisted of two phases: **(i) the first phase**, launched in 2012, aimed at education and training sector modernization, strengthen cooperation between European Union (EU) and Central Asia (CA), improvement of inter-regional cooperation between Central Asia countries, as well as improvement of donors' activities in the education sector; **(ii) the second phase (CAEP 2)**, launched in 2015, will continue enhancing cooperation between stakeholders from EU and CA countries, as well as between CA countries. The main goal of CAEP 2 is to strengthen education reforms in CA countries. The second phase will be running until March 2018.

In the Indicative Roadmap of Activities under the CAEP (2015-2018), endorsed during the First Ministerial Meeting of Ministers of Education in Riga in June 2015, and confirmed in the Astana Declaration during the Second Ministerial Meeting in June 2017 in Astana, **“enhancing employability of HE and VET graduates”** has been identified as one of the fields of activity for CAEP.

Based on that, this study aims at providing a review of selected good or even best practice for successful existing cooperation models / schemes and institutional arrangements / settings between business (enterprises, business associations, chambers etc.) and HE and VET institutions in the EU and Central Asia countries to strengthen employability among HE and VET graduates.

The report is divided into five main sections:

Following this introductory section, the second chapter provides an overview of legislative frameworks influencing the cooperation between business and education.

The third chapter presents an overview of existing programmes in the EU and in Central Asia that provide funding for business-education collaboration activities. In addition to that, 10 examples of good practice from EU Member States and 12 examples from the countries of Central Asia are elaborated in brief case studies.

The final two chapters provide a summary of identified challenges and formulate recommendations for stakeholders and decision makers in Europe and Central Asia.

2.2 Definition of Cooperation Schemes between Business and Education

To become competitive and to ensure sustainable growth of countries and/or regions, it is necessary to produce quality skilled workforce and to promote the skills matching in the labour market. Furthermore, quality education is a key to personal development and well-being of individuals. Providers of such skills, relevant to this study, are:

- **higher education institutions (HEIs)** – encompass a wide range of institutions, such as universities, colleges, academies, trade schools, technology institutes. The functions of HEIs is threefold: (i) the provision of an educated workforce through mass tertiary education; (ii) the training of national and international specialists and the development of research activities with ties to non-academic actors (industry, politics, civil society); (iii) the conduct of academic research. Alongside the education and research activities, the HEIs are also focused on so-called “third mission” of knowledge transfer to private sector and wider society in order to provide society with variety social and economic benefits, for instance by providing scientific insights in addressing environmental or sanitary problems, or by creating business incubators, start-ups, and technological/science parks¹.
- **technical and vocational education and training institutions (TVET)** – in general, TVET provides learners with relevant job skills consisted of both theoretical knowledge and practical experience. According to UNESCO, TVET “equips people not only with vocational skills but with a broad range of knowledge, skills, and attitudes that are now recognized as indispensable for meaningful participation in work and life”². The TVET sector is divided into two main categories: (i) *initial TVET (IVET)* providing education and training to young people (usually under their 30) before entering the labour market or at the beginning of their professional life; and (ii) *continuing TVET (CVET)* represents the other sorts of TVET including education and training of teachers, employees, unemployed people, etc.³.

HEIs and TVET can be considered the key drivers of human capital development in today’s knowledge-based economy since they equip individuals with necessary education, knowledge, and skills needed in labour markets. Today’s learners need a different set of skills than those in past few decades. The emphasis is, more than ever, on soft skills, such as critical thinking, problem-solving, creativity. They also need to be familiar with new technologies and have sufficient digital literacy⁴. To provide them with such skills and to increase their employability as graduates, a certain proportion of cooperation between education institutions and business sector need to be developed. In the Study context, under **the business sector** we will understand all commercial companies of a national/regional economy, as well as business associations, federations, and chambers. The study is based on a premise that the cooperation between education and business sector is beneficial to all stakeholders involved, as well as for society in general.

¹ <http://www.oecd.org/innovation/policyplatform/48373782.pdf>

² <http://www.unesco.org/new/en/newdelhi/areas-of-action/education/technical-vocational-education-and-training-tvet/>

³ OECD, 2010. Learning for Jobs, available online: <https://www.oecd.org/edu/skills-beyond-school/Learning%20for%20Jobs%20book.pdf>

⁴ <https://www.weforum.org/agenda/2015/07/why-education-is-the-key-to-development/>

2.2.1 Cooperation Schemes between HEIs and Business

Cooperation between HEIs and business represents a significant source of innovation and economic growth. The most effective is the long-term cooperation built around a common research vision⁵. In general, such cooperation encompasses “all types of direct and indirect, personal and non-personal interactions between HEIs and business for reciprocal and mutual benefit ...”⁶. The primary focus of this cooperation is in joint research, but it can have an impact on teaching, learning and curricula modernization as well. For instance, teachers can participate in internal business projects as external team members, and researchers from the company can lecture at the HEI⁷.

According to the findings from a prepared study on the State of University-Business Cooperation in Europe, there are following main forms of HEIs-business cooperation:

- 1. Research cooperation** is considered the most common and the most important form of cooperation, which encompasses cooperation in the field of *research and development* (hereafter R&D), *consulting to business*, and/or the *mobility of staff* (temporary or permanent movement from HEIs to business sector)⁸. Consulting or expertise to business and mobility of staff are mostly tools for ensuring sustainability of cooperation between HEIs and business sector. However, it is significantly influenced by the *external environment*, such as socio-economic structure of the region where the HEI is located, national and regional policies in place, geographical proximity to relevant industries, clusters, hubs, and other academic institutions; and *internal focus* of the HEI and business sector, their vision and strategy.

The main aim of research cooperation between HEI and business sector is “furthering regional and local development and establishing university-business partnerships that could contribute to increase competitiveness and innovation and produce added-value products and services”⁹. The reasons behind engaging in this form of cooperation can vary. The most common reasons for all stakeholders is to strengthen their R&D capacity, to increase their competitiveness and to improve the degree of professionalization of their human resources. Engagement of universities can help them to broaden their research funding sources, identify new challenges, increase the number of publications, or translate the research results into real products with their place on the market. Such collaborative research can enhance the employability of university’s students and young researchers in non-academic sector. For business sector, collaborative research can bring solutions for certain industry challenges or develop new innovative products or services since they have access to professional academic expertise in specific research areas. Collaborative research provides benefits to the region and its population as well. It can enhance region’s attractiveness, competitiveness or its position in specific knowledge areas, or find innovative solutions for current societal challenges. It is therefore vital to engage other stakeholders in a collaborative research, especially when it comes to funding. The public sector plays a crucial role in this area¹⁰.

- 2. Valorisation of cooperation** represents the use of the research results financed by public or private sector. It helps to accelerate the scientific progress (such as to develop new products or services), supports the socio-economic development and competitiveness,

⁵ EDMONDSON, G. et al. 2012. Making Industry-University Partnership Work. Lessons from Successful Collaborations. Available online: <http://www.sciencebusiness.net/sites/default/files/archive/Assets/94fe6d15-5432-4cf9-a656-633248e63541.pdf>

⁶ Davey, T. et al. 2011. Study on the cooperation between Higher Education Institutions and public and private organisations in Europe, Science-to-Business Marketing Research Centre. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/tools/docs/uni-business-cooperation_en.pdf

⁷ EDMONDSON, G. et al. 2012. Making Industry-University Partnership Work. Lessons from Successful Collaborations. Available online: <http://www.sciencebusiness.net/sites/default/files/archive/Assets/94fe6d15-5432-4cf9-a656-633248e63541.pdf>

⁸ <https://ub-cooperation.eu/index/blogitem/id/4712>

⁹ European University Association. 2014. University-Business Collaborative Research: Goals, Outcomes and New Assessment Tools.

¹⁰ European University Association. 2014. University-Business Collaborative Research: Goals, Outcomes and New Assessment Tools.

helps to find new sources of funding for further research, and generates additional income which can be shared by the investors.

There are various forms of valorisation of research results: *(i) open science model* - valorisation is primarily achieved through education and the publication of research results, where these can be used free by all stakeholders; *(ii) technology transfer models* that are based on protection of research discoveries through intellectual property rights in order to establish an exploitation monopoly for a particular area and timeframe. Valorisation is then achieved through the licensing process to existing businesses; *(iii) open innovation model or exchange of knowledge* is based on principles of free sharing of knowledge, know-how, and free licenses. This approach allows all stakeholders to acquire a competitive advantage by creating partnerships with other ones. Establishment of research laboratories, as one of the possible outputs of this approach to valorisation, can bring advanced skills to industry in the form of various consultancy services; *(iv) creation of new activities*¹¹, mainly new companies/business forms based on the results of research projects and activities. **Spin-offs** are newly established companies focused on applying innovative business plans and the commercialization of know-how or technologies developed by public research organisations. Spin-offs are generally used for new technologies which cannot be exploited by existing businesses without changing their operating model. Another form of business are **start-ups**, the early stage companies without commercial operations. They usually have a business plan including market studies, but need to start their own R&D, design, develop and test a new product, and to find financial resources to even do so¹². At technology-oriented HEIs, **technology (or science) parks** are replacing start-ups. They are strategically planned to connect local/regional HEIs, business sector as well as government, in order to share knowledge, promote innovation and enhance research outcomes and to commercialize them. These parks are fully equipped with necessary technology and R&D facilities¹³. Both forms (spin-offs and start-ups) can create a common platform of **academic incubators**, places connecting ideas, knowledge, and skills of students, academics and entrepreneurs and resulting in new innovative ideas. Depending on their purpose or overall mission of the HEI, academic incubator can provide coworking or maker spaces, conference rooms, laboratories as well as mentoring services¹⁴;

3. **Cooperation in the areas of education** – HEIs and business often cooperate in the development and creating study programmes, courses, modules, as well as guest lectures by delegates from private- and public-sector organizations. This leads to *creating new or revision of existed curricula and its delivery* to learners in order to promote the development of human resources relevant to modern society. Alongside curricula development and delivery, this form of cooperation encompasses *mobility of students* (temporary or permanent movement from HEIs to business), *dual education programmes* (combination of two places of learning – HEIs and company/workplace, however meeting both academic standards and company rules, and resulted in double qualification¹⁵), and *lifelong learning* (adult education, permanent and/or continuing education involving acquisition of skills, knowledge, attitudes and behaviours at all stages of life);
4. **Cooperation at a management level** – this form of cooperation includes *(i) joint governance*, mostly as involvement of academics in company decision-making or sitting in its boards and vice versa involvement of businesses in management of HEIs. It is an important mechanism for coordinating and controlling collaboration activities of HEI and

¹¹ <http://www.innovation.public.lu/en/cooperer/valorisation/index.html>

¹² <http://invega.lt/wp-content/uploads/2016/05/DIFASS-Brochure-6-Spin-Off-Start-Up-and-Early-Stage-Support.pdf>

¹³ https://en.wikipedia.org/wiki/Science_park

¹⁴ <https://www.gensler.com/research-insight/in-focus/the-rise-of-academic-incubators>

¹⁵ Thematic University-Business Forum, Berlin, 2014. University-Business Cooperation: Driving Competitiveness, Employability and Prosperity. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/tools/docs/university-business-berlin_en.pdf

business sector, since it contributes to risk mitigating and coordinating resources. This form of cooperation is therefore used especially with collaborative research projects¹⁶; and (ii) *shared resources*, such as human resources, laboratories, conference rooms, material, technology, finance shared by HEIs and businesses. Sharing of resources can significantly reduce costs and build trust among HEIs and companies, which is important for other forms of cooperation, especially in collaborative research.

- 5. Career counselling and alumni work** – the career services at HEIs help students to develop, evaluate and pursue their career goals. *Career counselling* serve actual students by providing appropriate assistance at each stage of their career development. Career counselling is usually offered on one-to-one basis, but in some cases, it is provided through group workshops or classes. Students are guided in thinking about their interests, values, competencies and personal characteristics and in development of awareness of options they have after graduation. An important output of career counselling is development of job search skills of students, including writing of resumés and cover letters, and job interview skills. Additionally, a career counselling office at HEI can connect students with potential employers by organising individual meetings or job fairs¹⁷. Another career service frequently offered to students is *development of networks with HEI's alumni*. Good alumni relationships are beneficial for all parties: HEIs benefit from alumni's skills and experience which are subsequently offered to actual students. Additionally, alumni are a significant source of PR across their personal and professional networks which again is beneficial for both students and the HEI. Alumni can be engaged in lectures, seminars or writing newsletters, but they can also provide students with opportunity in work placement and help them to launch their career. They can also provide HEI with some financial donations, or equipment. For alumni, such cooperation can provide them with current knowledge or research findings, innovation ideas as well as fresh workforce. Cooperation with their alma mater can be an important source for their personal or professional marketing as well¹⁸. Another important tool for improvement of HEI performance and alignment with business sector represents *graduate tracking surveys or tracer studies*. Graduate tracking "can also guide prospective and current higher education students to make informed decisions about the field of study and institution. (...) Career tracking systems make it possible to analyse the impact of graduate characteristics and programme design on labour market outcomes"¹⁹. Tracer studies represent a tool for measuring employment of graduates in terms of economy sector, size of the enterprise, quality of job, as well as the length of the job search period, graduates' job satisfaction, and the match between competencies and enterprise requirements. They can significantly improve education and training curricula and the whole study programmes since they are asking about the courses student took during his/her study, its content, quality of teaching material, organisation of the study, etc. In addition to that, employers may be asked questions about the relevance and quality of education of HEI's alumni who work in the given company. Even though tracer studies are more popular in the field of HE, they are becoming popular in VET sector, too²⁰.

The cooperation between HEIs and business sector should be based on principles of equality "where both recognize their strengths and weaknesses and where both are equal drivers for change,..."²¹. HEIs contribute to such cooperation with intellectual content and support while

¹⁶https://www.researchgate.net/publication/268211640_The_impacts_of_governance_mechanisms_and_knowledge_conversion_on_university-business_collaboration_performance?enrichId=rgreq-60a1ba40220da7ad8f07f83cad76de1e-XXX&enrichSource=Y292ZXJQYWdlOzI2ODIxMTY0MDtBUzo0MDcyOTAwNTEwODgzODRAMTQ3NDExNjkyMzUwOQ%3D%3D&el=1_x_3&_e_sc=publicationCoverPdf

¹⁷ <http://education.stateuniversity.com/pages/1813/Career-Counseling-in-Higher-Education.html>

¹⁸ <https://www.redbrickresearch.com/2015/10/29/the-importance-of-the-alumni-network/>

¹⁹ <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=21624&no=3>

²⁰ [https://www.etf.europa.eu/webatt.nsf/0/CEDE612F00BFF6B3C12581A600278816/\\$file/Tracer%20studies.pdf](https://www.etf.europa.eu/webatt.nsf/0/CEDE612F00BFF6B3C12581A600278816/$file/Tracer%20studies.pdf)

²¹ http://www.eesc.europa.eu/sites/default/files/resources/docs/657_en_lowres.pdf

businesses contribute with their knowledge of new trends in the marketplace and, at the same time, offer the opportunity for gaining practical experience²².

2.2.2 Cooperation Schemes between VET Institutions and Business

The proper skills of graduates matching the market needs are crucial in today's economy worldwide. The shift in the economy brought along a shift in a set of skills required from employers, too. Even though basic vocational skills are perceived as sufficient, the current knowledge-based economy demands skills even in the area of so-called transversal (a.k.a. cross-cutting or soft) skills that cannot be sufficiently (for the future employability of graduates) developed in the classrooms. A certain amount of improvement needs to be ensured even within professional (specialized/sectoral) vocational skills.

According to Vroonhof, et al. (2017), VET "can play a crucial role in tackling many of the most pressing challenges that Europe is faced with today, such as competitiveness, youth unemployment, and social inclusion. To put the VET-sector in the best possible position to do so, it is crucial to increase quality and attractiveness of VET"²³. An efficient way how to achieve this is to promote VET-business cooperation.

Cooperation between VET institutions and business sector is crucial for ensuring both the quality of education and the quality of skills which companies really need and is crucial for minimizing the gap between demand and supply of the skills at the labour market²⁴. The most common forms of VET-business cooperation are as follows:

- 1. Curricula development or adjustment** – this form of cooperation comprises the whole process from the development of curricula, through its delivery to learners to feedback for identification of necessary future changes. The aim "is to make the provision of VET efficient in terms of matching supply and demand given certain condition"²⁵. It is mostly implemented in countries with school-based and dual VET systems, where companies are not satisfied with the objectives and/or content of the study programmes since they do not correspond to their requirements²⁶. This form of cooperation can result in the development of the new programmes or courses.
- 2. Work-based learning (WBL)** – is a key aspect of VET as it provides learners with both professional and soft skills. The most significant advantage of WBL is that learners become a part of an organization and its culture, and they have to communicate effectively with their co-workers as well as customers²⁷. According to the Bruges communiqué on Enhanced European Cooperation in Vocational Education and Training for the Period 2011-2020 the "work-based learning is a way for people to develop their potential. The work-based component contributes substantially to developing a professional identity and can boost the self-esteem..."²⁸.

²² http://www.eesc.europa.eu/sites/default/files/resources/docs/657_en_lowres.pdf

²³ Vroonhof, P. 2017. Business cooperating with vocational education and training providers for quality skills and attractive futures. Available online: <http://ec.europa.eu/social/BlobServlet?docId=18591&langId=en>

²⁴ Danish Technological Institute, 2014. Preparation of the European Business Forum on Vocational Training. Survey of VET-business cooperation on skills, entrepreneurship and apprenticeships. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/library/study/2014/business-forum_en.pdf

²⁵ Vroonhof, P. 2017. Business cooperating with vocational education and training providers for quality skills and attractive futures. Available online: <http://ec.europa.eu/social/BlobServlet?docId=18591&langId=en>

²⁶ Euler, D. 2017. Engaging the Business Sector in Vocational Education and Training (VET) – Working Tool for the Political Dialogue and Project Design in Development Cooperation. Available online: <https://www.dcdualvet.org/wp-content/uploads/DCdualVET-STUDY-Working-Tool-Engaging-the-Business-Sector-EN.pdf>

²⁷ Danish Technological Institute, 2014. Preparation of the European Business Forum on Vocational Training. Survey of VET-business cooperation on skills, entrepreneurship and apprenticeships. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/library/study/2014/business-forum_en.pdf

²⁸ European Commission. 2010. The Bruges Communiqué. Available online: www.cedefop.europa.eu/EN/Files/bruges_en.pdf

There are three main forms of WBL²⁹: (i) *apprenticeships, internships, and traineeships* – this form represents useful way how to gain new skills and to bridge the gap between school and work. *Apprenticeships* have a clear duration and purpose, usually corresponding to learner's field of study. They combine the classroom learning with practical training at a workplace. Evidence shows that learners who participated in apprenticeships perform better in the labour market. A specific form of apprenticeship are *dual study programmes* combining apprenticeships in a company and vocational education at a vocational school in one course. *Traineeships* are usually unrelated to the learner's field of study, they represent a work practice where trainees can gain some work experience. Finally, *internships* have usually a shorter period and are completed by graduates before their actual job search in order to gain experience in the field they want to find a job³⁰. (ii) *school-based VET with on-the-job training* – includes a training period at companies, usually one-on-one training where there the supervisor shows the student how to perform the task; and (iii) *WBL integrated in a school-based programme* – this form comprises on-site labs, workshops, junior or practice firms, simulations, and real business/industry project assignments, and can be performed with or without the business sector involvement, depending on location and/or interest of local/regional businesses. The aim of this form is to create "real life" work environment and to establish new contacts and/or cooperation with companies³¹.

3. **Shared resources** – including staff, space, material, and/or finance. Sharing of equipment is mainly visible in technology-intensive occupation. New and modern equipment is usually expensive and inaccessible for VET school so this is where companies can offer them assistance, either by providing this technology, practice-relevant materials or teaching materials. However, the situation can be the opposite, when VET schools are better-equipped thanks to the implementation of certain development projects. Regarding finance, it is mostly related to the division of certain expenditures between actors or to the funding of VET programmes (either directly or indirectly via taxes)³².
4. **Governance** – comprises establishing of VET councils (which can ensure achieving of better outcomes through VET) and building relationships among them and sector councils, as well as developing tools such as National Qualifications Frameworks (described in following parts of the study), occupational standards and/or quality assurance mechanisms. In addition to business sector and VET, public institutions can be a vital member of a partnership in governance. They can coordinate the dialogue and provide various resource, such as statistical data, human resources as well as finance necessary for this form of cooperation³³.
5. **Cooperation in product development** – in some cases, students and trainers in cooperation with company employees can significantly contribute to the design, development and construction of new products and/or innovation of production processes.

The forms of cooperation are specific from case to case. The VET-business cooperation encompasses any form of cooperation between these two sectors, including cooperation between

²⁹ Vroonhof, P. 2017. Business cooperating with vocational education and training providers for quality skills and attractive futures. Available online: <http://ec.europa.eu/social/BlobServlet?docId=18591&langId=en>

³⁰ https://ec.europa.eu/eures/public/news-articles/-/asset_publisher/L2ZVYxNxK11W/content/traineeship-internship-apprenticeship-which-one-is-for-you-?_101_INSTANCE_L2ZVYxNxK11W_backLabelKey=news.articles.back.to.list&_101_INSTANCE_L2ZVYxNxK11W_showAssetFooter=true

³¹ Danish Technological Institute, 2014. Preparation of the European Business Forum on Vocational Training. Survey of VET-business cooperation on skills, entrepreneurship and apprenticeships. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/library/study/2014/business_forum_en.pdf

European Commission. 2013. Work-Based Learning in Europe. Practices and Policy Pointers. Available online:

http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/alliance/work-based-learning-in-europe_en.pdf

Vroonhof, P. 2017. Business cooperating with vocational education and training providers for quality skills and attractive futures. Available online:

<http://ec.europa.eu/social/BlobServlet?docId=18591&langId=en>

³² Euler, D. 2017. Engaging the Business Sector in Vocational Education and Training (VET) – Working Tool for the Political Dialogue and Project Design in Development Cooperation. Available online: <https://www.dcdualvet.org/wp-content/uploads/DCdualVET-STUDY-Working-Tool-Engaging-the-Business-Sector-EN.pdf>

³³ [http://www.etf.europa.eu/webatt.nsf/0/5C0302B17E20986CC1257C0B0049E331/\\$file/Multilevel%20governance%20x%20VET.pdf](http://www.etf.europa.eu/webatt.nsf/0/5C0302B17E20986CC1257C0B0049E331/$file/Multilevel%20governance%20x%20VET.pdf)

individual teachers and in-company trainers³⁴. The scope of cooperation is, however, determined by various factors, such as the economic structure of the region/country – the willingness to cooperate with the VET sector differs in micro- and small enterprises and medium-sized and large ones³⁵. Another important element is the existing VET system in the country, whether it is mostly school-based, supporting the on-the-job training, or the dual VET system³⁶.

2.2.3 Cooperation Schemes between HEIs and VET Institutions

Both HE and VET represent necessary institutions providing right skills at the right time not only to youth but also when it comes to lifelong learning. The need for improving permeability³⁷ of these two systems is an ongoing challenge based on the diversity of both systems and overall economic and social situation worldwide, even though both systems follow the same goal which is to increase quality and employability of their graduates. To meet this goal, variety of new approaches in cooperation are adopted, such as: (i) *integration of vocational content into HE curricula*; (ii) *mutual enrichment of two educational systems via closer cooperation in respect of a certain specificities*; (iii) *development of common structures of recognition, certification and qualification*; (iv) *development of common general subjects for students of both HE and VET*³⁸.

However, the most significant impact on the improvement of cooperation and/or permeability between HE and VET seems to be the implementation of Qualifications Frameworks. At the European policy level, the development of the **European Qualifications Framework (EQF)** represents the new conception of the relationship between HE and VET. The emerging or existing **National Qualifications Frameworks** have a similar impact as the EQF, however, “the major issue lies in designing qualifications descriptors that apply to VET and HE qualifications and in designing structures that would/could link VET and HE”³⁹. Both topics are described in the following part of the Study.

Alongside enhancing the employability of graduates the cooperation between education institutions and business sector has a variety of **advantages** for all involved parties. The major advantages for **students** comprise improvement of their learning experience, increasing of practical skills in the field of their study, development of their soft skills, improving their earning power after graduation, as well as the possibility to earn some money during their study. Thanks to the cooperation activities, **education institutions** can increase their contact and interactions with the local or regional community and have an opportunity to respond to its specific needs. They can also increase their academic reputation in the field, promote their internal research, and achieve its research and overall mission. To **business sector**, the mutual cooperation with education sector can improve its performance, provide an opportunity to train their future employees according to their corporate culture and rules, create a pool of well-trained personnel, as well as reduce the

³⁴ Vroonhof, P. 2017. Business cooperating with vocational education and training providers for quality skills and attractive futures. Available online: <http://ec.europa.eu/social/BlobServlet?docId=18591&langId=en>

³⁵ EPF. 2017. The Role of the Private Sector in Vocational and Educational Training. Developments and Success Factors in Selected Countries. Available online: https://www.bibb.de/dokumente/pdf/epf_the_role_of_the_private_sector_in_vet_official.pdf

³⁶ Euler, D. 2017. Engaging the Business Sector in Vocational Education and Training (VET) – Working Tool for the Political Dialogue and Project Design in Development Cooperation. Available online: <https://www.dcdualvet.org/wp-content/uploads/DCdualVET-STUDY-Working-Tool-Engaging-the-Business-Sector-EN.pdf>

³⁷ „guaranteeing learners the possibility to move from VET to HE and vice-versa, by the transparency of study programmes and the mutual recognition of learning outcomes“ In: DONDI, C. 2014. Quality of Vocational Education and Training (VET) and Higher Education (HE) in Central Asia. Study Report. Available online: http://www.caep-project.org/wp-content/uploads/2014/09/01_CAEP-Study-Quality-VET-HE-with-Supplement-Report.pdf

³⁸ DUNKEL, T.; Le MOUILLOUR, I. 2009. Through the Looking-Glass. Diversification and Differentiation in Vocational Education and Training and Higher Education. In: Modernising Vocational Education and Training. Fourth report on Vocational Training and Research in Europe: Background Report. Available online: https://www.researchgate.net/profile/Ulrich_Teichler/publication/237718096_Through_the_looking-glass_Diversification_and_differentiation_in_vocational_education_and_training_and_higher_education/links/55aacc7508aea3d086827c52/Through-the-looking-glass-Diversification-and-differentiation-in-vocational-education-and-training-and-higher-education.pdf

³⁹ DUNKEL, T.; Le MOUILLOUR, I. 2009. Through the Looking-Glass. Diversification and Differentiation in Vocational Education and Training and Higher Education. In: Modernising Vocational Education and Training. Fourth report on Vocational Training and Research in Europe: Background Report. Available online: https://www.researchgate.net/profile/Ulrich_Teichler/publication/237718096_Through_the_looking-glass_Diversification_and_differentiation_in_vocational_education_and_training_and_higher_education/links/55aacc7508aea3d086827c52/Through-the-looking-glass-Diversification-and-differentiation-in-vocational-education-and-training-and-higher-education.pdf

costs and achieve own mission⁴⁰. An additional advantage is the revision of curricula and creating of new study programmes, courses or modules reflecting current market needs. This is the common advantage for all above-mentioned parties since it influences all of them.

⁴⁰ <https://www2.palomar.edu/pages/cooped/faqs/what-are-the-benefits-of-cooperative-education/>

Davey, T. et al. 2011. Study on the cooperation between Higher Education Institutions and public and private organisations in Europe, Science-to-Business Marketing Research Centre. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/tools/docs/uni-business-cooperation_en.pdf

3 Background of Cooperation Schemes between Business and Education

3.1 Policies and Frameworks in the EU

EU is well aware of a crucial role of education in the socio-economic development. Its effort in the field of education and training is to make the systems worldwide as unified as possible and to help countries to benefit from well-educated and skilled workforce. The quality workforce will contribute to meeting the objectives of the **Europe 2020 Strategy** for smart, inclusive and sustainable growth and jobs creation. The following text provides a brief overview of the most relevant EU policies and frameworks in the field of HE and VET development.

In the field **higher education**, the most significant driver is the *Bologna Process*, launched in 1999 when 29 education ministers from European countries signed the Bologna Declaration. It represents a collective effort of various stakeholders from the public, private and non-profit sector to create a common European Higher Education Area (EHEA) in order to harmonize and modernize education and training systems of member countries⁴¹.

The Bologna Process is focused on three main areas concerning unified, comparable and compatible higher education systems: **(i) the introduction and implementation of the three-cycle system** (bachelor – master – doctorate); **(ii) strengthened quality assurance** (ensuring that HE curricula respond to changing needs of the wider economy); and **(iii) easier recognition of qualifications and periods of study within or across borders** (in order to increase employability and skill levels). In general, the Bologna Process increases compatibility between education systems around the world and simplifies students and job seekers mobility across Europe. It also supports the modernisation of education and training systems so they would be able to meet the needs of changing labour market⁴².

Another important step towards HE sector's development was the adoption and implementation of the recent **Communication on a renewed EU agenda for higher education** with **A renewed EU agenda for higher education** (this document complements and underpins the Communication) itself. Through different strands of the Erasmus+ and Horizon 2020, the Commission will be supporting the following key goals for European cooperation in HE:

1. Tackling future skills mismatches and promoting excellence in skills development;
2. Building inclusive and connected higher education systems;
3. Ensuring higher education institutions contribute to innovation;
4. Supporting effective and efficient higher education systems.

All of these goals are more or less focused on some form and scale of cooperation – whether with business sector or VET providers. In order to meet the above-mentioned goals, the EU will support activities such as the development of new curricula and education programmes reflecting new

⁴¹ http://ec.europa.eu/education/policy/higher-education/bologna-process_en

<http://www.ehea.info/pid34248/history.html>

⁴² http://ec.europa.eu/education/policy/higher-education/bologna-process_en

needs of the markets, promotion of work-based learning, international mobilities as well as ensuring permeability of different types of education and training⁴³.

Since 2008, the EU regularly organizes the **University-Business Forum (UBF)** which brings together HEIs, companies, business associations, public authorities and policymakers at a European level in order to boost networking and exchange of ideas and good practices. Up to now, more than 20 UBFs have been organized in Brussels, Austria, Spain and other Member states. Thanks to these events, new ideas, projects and policy tools have been developed, such as *Knowledge Alliances* (fostering innovation and strengthening links between employers and HEIs) currently under Erasmus+ programme and *HEInnovative*, an “independent self-assessment tool for higher education institutions to both measure and develop their innovative capabilities, and support them through case studies and training materials”⁴⁴.

The **Communication on European Higher Education in the World**, adopted in 2013, analyses the opportunities for cooperation between HEIs, EU member states and non-EU countries, including involvement of business sector. Within this framework, HEIs are encouraged to develop their own comprehensive internationalization strategies according to their own situation and needs. Such strategy should cover following areas: (i) international mobility of students and staff; (ii) the internalization and improvement of curricula and digital learning; (iii) strategic cooperation, partnerships, and capacity building⁴⁵.

In the field of **vocational education and training**, key reference institution for non-EU partners is the **European Training Foundation (ETF)**, a European Union’s decentralized agency established in 1990 in Turin, Italy, helping “transition and developing countries to harness the potential of their human capital through the reform of education, training and labour market systems in the context of the EU’s external relations policy”⁴⁶. The ETF supports projects facilitating the reforms of VET and employment systems in partner countries. In 2010, the ETF launched the **Torino Process**, the “biannual participatory analytical review of the status and progress of vocational education and training in the ETF partner countries”⁴⁷. Its main goal is to help the partner countries to develop, implement and monitor the VET-related policies.

Another EC’s decentralized agency supporting its goals in the field of VET in the EU is the **European Centre for the Development of Vocational Training (CEDEFOP)**. The agency is based in Greece since 1995 and supports the development of VET policies and their implementation. Its work is focused on strengthening the “European cooperation and provide the evidence on which to base European VET policy. Cedefop’s added value is the high quality of its comparative analyses and expertise gathered through research and networking, ...”⁴⁸.

An important step toward improving quality of courses, training, teachers, and trainers in VET represents the **Copenhagen Process**, launched in 2002. It was adopted by ministers responsible for VET in the Member States, candidate countries and other representatives from and outside the EU in Copenhagen where they meet to agree on a Copenhagen Declaration on enhanced European cooperation in VET. The Declaration emphasis the need for taking actions in VET, similar to those taken under the Bologna Declaration regarding HE. The Copenhagen Process is an integrated part

⁴³ Communication on a Renewed EU Agenda for Higher Education. 2017. Available online: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0247&from=EN>

⁴⁴ 7th European University-Business Forum. University-Business Cooperation – For Innovation and Modernisation. Forum Report. Available online: https://ec.europa.eu/education/sites/education/files/university-business-forum-2017-report_en.pdf

⁴⁵ Communication on European Higher Education in the World. 2013. Available online: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0499&from=EN>

⁴⁶ http://www.etf.europa.eu/web.nsf/pages/Who_we_are

⁴⁷ http://www.etf.europa.eu/web.nsf/pages/Torino_process

⁴⁸ <http://www.cedefop.europa.eu/en/about-cedefop/what-we-do>

of the Lisbon strategy and its main goals are “the development of lifelong learning and the promotion of mutual trust between the key players”⁴⁹. The Copenhagen Process consists of:

- „a **political dimension** aiming to establish common European objectives and reform national VET systems;
- the **development of common European frameworks and tools** that increase the transparency and quality of competences and qualifications and facilitate mobility;
- cooperation to foster **mutual learning at European level** and to involve all relevant stakeholders at national level”⁵⁰.

The first review of the Copenhagen Process took place at a ministerial meeting in Maastricht in 2004 and resulted in **Maastricht Communiqué**. The Communiqué confirmed success of the Copenhagen process in improving VET sector at a European level and set out following priorities for national-level work on VET: (i) increasing public and private investment in VET; (ii) developing VET systems that meet the needs of disadvantaged people and groups; (iii) developing learning environments in education institutions and in the workplace; (iv) promoting continuous development of skills and competence of VET teachers and trainers⁵¹.

The next evaluation of the Copenhagen Process was carried out in 2006 in Helsinki and resulted in **Helsinki Communiqué**. It acknowledges the following Copenhagen Process’s achievements: (i) progress made on the common European frameworks and tools for VET; (ii) adoption of the Europass single framework for the transparency of qualifications and competencies; and (iii) start of work on the European Qualifications Framework, the European Credit System for VET, and the European quality assurance reference framework for VET⁵².

The **Bordeaux Communiqué** 2008 acknowledged the relevance and effectiveness of the Copenhagen Process in development of VET systems. However, it identified the following areas that needed to be improved: (i) the implementation of VET tools and schemes to promote cooperation; (ii) the creation of better links between VET and the labour market; (iii) the consolidation of European cooperation arrangements⁵³.

Currently the last review of the Copenhagen Process provides the **Bruges Communiqué** 2010. It sets out 11 strategic objectives, based on previous Copenhagen Process achievements, for European cooperation in VET for the period 2011-2020. It also set out a list of 22 short-term deliverables for the period 2011-2014. In order to increase the attractiveness of VET as well as its ability to respond current and future challenges, the set-out objectives are:

- making initial VET an attractive learning option;
- fostering the excellence, quality, and relevance of both initial and continuing VET – including actions in the field of quality assurance, quality of teachers and trainers, employability of VET graduates;
- enabling flexible access to training and qualifications – with regard to both initial and continuing VET;
- developing a strategic approach to the internationalization of initial and continuing VET and promoting international mobility;
- fostering innovation, creativity, and entrepreneurship, as well as the use of ICT;
- realising inclusive initial and continuing VET;

⁴⁹ The Copenhagen Process – the European Vocational Education and Training Policy – Frequently Asked Questions (FAQ). 2004. Available online: ec.europa.eu/rapid/press-release_MEMO-04-293_en.pdf

⁵⁰ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:ef0018>

⁵¹ Maastricht Communiqué on the Future Priorities of Enhanced European Cooperation in Vocational Education and Training (VET). 2004. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/maastricht_en.pdf

⁵² The Helsinki Communiqué on Enhanced European Cooperation in Vocational Education and Training. 2006. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/helsinki_en.pdf

⁵³ The Bordeaux Communiqué on Enhanced European Cooperation in Vocational Education and Training. 2006. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/bordeaux_en.pdf

- greater involvement of VET stakeholders and greater visibility for the achievements of European cooperation in VET;
- coordinated governance of European and national instruments in the areas of transparency, recognition, quality assurance and mobility;
- intensifying cooperation between VET policy and other relevant policy areas;
- improving the quality and comparability of data for EU policymaking in VET;
- making good use of EU support (including Structural Funds and the Lifelong Learning Programme)⁵⁴.

A new set of medium-term deliverables in the field of VET for the period 2015-2020 is set out in the **Riga Conclusions 2015**, as a result of the review of the short-term deliverables defined in the Bruges Communiqué for the 2011-2014 period. This review found that the short-term deliverables helped to implement relevant reforms in the field of VET in European and candidate countries. The Riga Conclusions also established five priority areas for 2015-2020:

- promote work-based learning in all its forms;
- further develop quality assurance mechanisms in VET;
- enhance access to VET and qualifications for all through more flexible and permeable systems;
- further strengthen key competencies in VET curricula and provide more effective opportunities to acquire or develop those skills;
- increase opportunities for professional development of initial and continuing VET teachers, trainers and mentors in both school- and work-based settings⁵⁵.

In 2009, the **European Credit System for Vocational Education and Training (ECVET)** was adopted. Its main goal is to support lifelong learning, to simplify mobility of learners, teachers, trainers and job seekers across Europe, and to ensure they get a validation and recognition of their skills and knowledge acquired in different VET systems. ECVET is based on several principles and concepts "which are used in a systemic way to establish a common and user-friendly language for transparency, transfer, accumulation, and recognition of learning outcomes"⁵⁶. The adoption and implementation of ECVET are voluntary.

Another voluntary instrument designed to promote and monitor the improvement of VET systems in EU countries is the **European Quality Assurance Reference Framework (EQAVET)**. "EU countries use the framework to improve their quality assurance systems in a way that involves all relevant stakeholders"⁵⁷. This instrument helps to recognize acquired skills and competencies of learners in different countries and learning environments.

The Copenhagen process is an integral part of the EU **strategic framework for cooperation in education and training (ET 2020)**, a forum for "exchanges of best practices, mutual learning, gathering and dissemination of information and evidence of what works, as well as advice and support for policy reforms"⁵⁸ in both HE and VET sector. The ET 2020 has set out following strategic objectives: (i) making lifelong learning and mobility a reality; (ii) improving the quality and efficiency of education and training; (iii) promoting equity, social cohesion, and active citizenship; and (iv) enhancing creativity and innovation, including entrepreneurship, at all levels of education and training⁵⁹. The ET 2020 is addressing the following relevant policy areas:

⁵⁴ The Bruges Communiqué on enhanced European Cooperation in Vocational Education and Training for the period 2011-2020. Available online: http://ec.europa.eu/dgs/education_culture/repository/education/policy/vocational-policy/doc/brugescom_en.pdf

⁵⁵ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:ef0018>

⁵⁶ <http://www.ecvet-secretariat.eu/en/what-is-ecvet>

⁵⁷ http://ec.europa.eu/education/policy/vocational-policy/eqavet_en

⁵⁸ http://ec.europa.eu/education/policy/strategic-framework_en

⁵⁹ http://ec.europa.eu/education/policy/strategic-framework_en

- **improving attainment level and the quality and relevance of higher education** – through providing special guidance, counselling or admission arrangements to students, ensuring quality assurance, increasing university-business links and enhancing the employability of students;
- **improving skills and VET for youth employment** – development of the dual system, apprenticeships, internships and work-based learning, the establishment of skills monitoring and forecasting systems, ensuring labour market relevance of VET, providing career guidance and employment services, providing re- and up-skilling as well as entrepreneurial skills training;
- **increasing adult participation in lifelong learning** – through providing career guidance, flexible study opportunities, and pathways, financial support, setting up qualifications frameworks, standards and quality assurance in VET⁶⁰.

In order to enable learners and teachers' free movement across and outside Europe and to recognize their diplomas or certificates issued in different countries with different national education and training systems, the **European Qualification Framework** for lifelong learning (EQF) was developed. It is an instrument that "helps to compare national qualifications systems and enable communication among them"⁶¹. Its core is 8 common European reference levels (where level 1 is the lowest level of proficiency and level 8 is the highest), which are described in learning outcomes – knowledge, skills and responsibility, and autonomy – and explain what a learner knows and is able to do. Such approach enables to compare all types and level of qualification including HE and VET but also qualifications awarded by the private sector and international organizations⁶². The EQF is compatible to the qualification framework of the Bologna Process (the three-cycle).

3.2 Policies and Frameworks in Central Asia

In 2007, the European Union launched the *EU Central Asian Strategy for New Partnership* in order to support various cooperation priorities with the five Central Asia countries. The European Education Initiative (EEI) has been initiated within the framework of the Strategy, aiming at "incorporating existing European programmes in the field of higher education and vocational education and training (VET), as well as developing new cooperation formats, ..." ⁶³.

The main objectives of the EEI for Central Asia are twofold: (i) to reform and modernise the education systems within the CA countries in order to meet changing needs and demand of globalised world, and to increase cooperation of these countries with major international stakeholders and donors supporting educational programmes; and (ii) to support student and academic staff exchanges within all levels of education, including VET and HE, through various international and bilateral programmes⁶⁴.

The EEI is trying to provide a common framework for European support to the CA education sector. The Initiative "is centered on existing initiatives, on EU support at the national and regional level, and coordination with other international donors"⁶⁵. The Initiative helped to create closer links

⁶⁰ Education, Audiovisual and Culture Executive Agency. 2013. Education and Training in Europe 2020. Responses from the EU Member States. Available online: http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/163EN.pdf

⁶¹ <https://ec.europa.eu/ploteus/content/how-does-efq-work>

⁶² <https://ec.europa.eu/ploteus/content/how-does-efq-work>

⁶³ Axyonova, V. 2013. The EU Education Initiative for Central Asia five years on: lessons learnt?

⁶⁴ <http://dbase.caep-project.org/project/caep-2-central-asian-education-platform-phase-2-caep-2/>

⁶⁵ http://eeas.europa.eu/archives/docs/central_asia/docs/factsheet_education_en.pdf

between Central Asia and Europe, especially the European Higher Education Area (EHEA) through various mobility and capacity development programmes and international cooperation modalities.

Participating Ministers and delegates of the second ministerial meeting in Astana in 2017 acknowledged the progress made in the field of HE and VET in Central Asia within the EEI. They agreed that following areas should stay a priority for the future mutual cooperation among CA, European Commission and EU Member States: (i) development of qualification frameworks and standards; (ii) quality assurance and accreditation; and (iii) employment and labour market needs; and agreed on following new priorities to be supported: (iv) innovative teaching methods; (v) contribution of education to prevent violent radicalisation of youth; (vi) contribution of education in addressing gender inequalities; and (vii) effective financing of education systems and education institutions⁶⁶.

One of the areas of on-going support are the **Qualifications Frameworks**. They are designed in accordance with dynamic and complex national education and training systems and labour markets. Their purpose is to make qualifications easier to understand and compare in order to support learning across different areas as well as countries. Similarly to the EQF, the **National Qualifications Frameworks (NQF)** “classify qualifications by level, based on learning outcomes. This classification reflects the content and profile of qualifications – that is, what the holder of a certificate or diploma is expected to know, understand, and be able to do. The learning outcome approach also ensures that education and training sub-systems are open to one another. Thus, it allows people to move more easily between education and training institutions and sectors”⁶⁷.

The ETF identified four components of qualification systems that are vital for their effective functioning in different environments:

- **the legal and regulatory framework** – reforming qualification system is a complex process, involving many issues including developing qualifications based on learning outcomes, the involvement of employers, quality assurance measures, etc.;
- **effective stakeholder dialogue** – involvement of various stakeholders (public and/or private) in the setting out the qualification frameworks provides it with a significant amount of credibility;
- **institutional arrangements** – allocation of functions and roles to official or formalised bodies in the process of design, implementation, coordination, and regulation of the qualification system;
- **quality assurance systems** – development of standards, assessment, certification⁶⁸.

CA countries are currently working on the implementation of National Qualifications Framework as a component of their National Qualification Systems based on the principles of lifelong learning, but they are all at different stages in the process of designing and/or implementing it.

3.2.1 Kazakhstan

The basis of the state policy in the field of education represents the Constitution of the Republic of Kazakhstan (1995)⁶⁹. The **law of the Republic of Kazakhstan About Education** “regulates social relationship in the area of education, determines general principles of state policy in this area and is directed to provide citizens’ constitution right for education of the Republic of Kazakhstan and also

⁶⁶ Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmml=216>

⁶⁷ <http://www.cedefop.europa.eu/en/events-and-projects/projects/national-qualifications-framework-nqf>

⁶⁸ GRAHAM, M.; DEIJ, A. 2017. Organising to Deliver National Qualifications Frameworks. In Global Inventory of Regional and National Qualifications Frameworks 2017. Volume I: Thematic Chapters. Available online: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/2221>

⁶⁹ Overview of the Higher Education System, Kazakhstan. 2017.

foreign citizens and stateless citizens, permanently residing in the Republic of Kazakhstan"⁷⁰. The Law on Education has been adopted in 2007 and amended in 2015. Since 2008, Kazakhstan has launched a series of initiatives aimed at modernising its education and training system, including the **State Programme for Modernising TVET 2008**, the **Accelerated Industrialisation and Innovation Strategy, adopted in 2010**⁷¹. In 2012, Kazakhstan introduced **independent accreditation** of institutions and programmes in HE, and since 2015 in VET as well⁷².

Other relevant national strategies are **Kazakhstan 2050 Strategy**, outlined by the President Nursultan Nazarbayev in 2012, is a continuation of former Kazakhstan 2030, which was adopted in 1997 with seven key directions concerning economic policy, support of entrepreneurship, social policy, modernising HE and VET, development of democracy, development of a foreign policy, and building national confidence⁷³. In 2012, the Ministry of Education and Science has released the **Academic Mobility Strategy in Kazakhstan for 2012 – 2020**. It represents "a policy document setting aims and priorities of academic and cultural internationalization of higher education in Kazakhstan through the development of tools of the Bologna Process"⁷⁴. Its main goal, to ensure transparency in HE and achieve balanced mobility, comprises four main tasks: (i) quality assurance of external mobility; (ii) quality assurance of host conditions for foreign professors, researchers, and students in Kazakhstan; (iii) implementation of the principles of multilanguage education; (iv) expansion of direct links with overseas partner universities and international organizations⁷⁵.

Since Kazakhstan is the only formal member of the Bologna Process (joined in 2011) among the CA countries, it was bounded to implement **National Qualifications Framework**. The Framework's development started in 2012 by the Joint Order 8022 of 19 October 2012, adopted by the Ministries of Health and Social Development and Education and Science, and updated by those Ministries in 2016. The Framework "is intended to address challenges in streamlining existing qualifications; linking qualifications to labour market needs better; clarifying relationship between qualifications and salaries and career paths"⁷⁶.

The NQF is covering both HE and VET qualifications within an 8-level structure, where levels 6 – 8 are covering degrees awarded in HE and levels 2 – 4 are covering qualifications in VET. Currently, Kazakhstan has developed over 20 sectoral qualification frameworks (SQF) in areas such as metallurgy, construction, oil and gas, engineering, and transport. SQFs are used to classify industry requirements for each qualification. However, they are not yet linked to NQF⁷⁷.

The implementation of NQF is led by the Ministries of Education and Science and Health and Social Development. There are 16 sector councils in Kazakhstan operating in skills development, including occupational standards. In VET sector, there is a trend in growing engagement of business, including the National Chamber of Entrepreneurs, in the fields of curricula and qualifications development and overall VET modernisation⁷⁸.

Kazakhstan has made considerable progress with the introduction of the **dual approach**, as by 2016 about 60% of VET colleges applied the approach fully or at least its key elements. 2016 was also a year of legislative adaptations, as the dual approach was legally established by the Law on Education and the labour code, introducing inter alia the position of a young specialist – a student

⁷⁰ <http://kguti.kz/en/37-english/normativnye-dokumenty/295-the-law-of-the-republic-of-kazakhstan-about-education.html?showall=1&limitstart=>

⁷¹ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kazakhstan%20-%20NQF%20Inventory

⁷² Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmdl=216>

⁷³ <http://www.kazakhstanlive.com/Documents/Kazakhstan%202050%20Strategy%20summary.pdf>

⁷⁴ Academic Mobility Strategy in Kazakhstan for 2012 – 2020, 2012

⁷⁵ Academic Mobility Strategy in Kazakhstan for 2012 – 2020, 2012

⁷⁶ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kazakhstan%20-%20NQF%20Inventory

⁷⁷ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kazakhstan%20-%20NQF%20Inventory

⁷⁸ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kazakhstan%20-%20NQF%20Inventory

who holds an employment contract with a company. Furthermore, a new education standard was adopted to provide flexibility to providers working under the dual approach. A key success factor for development in Kazakhstan has been the development of the dual approach implementation roadmap (2015), under the leadership of the National Chamber of Entrepreneurs. The National Chamber plays an important role to convince enterprises to take part and support partnerships with colleges at the local level. The Chamber is developing training for in-company trainers working with VET students.

According to the latest ETF's Torino Process 2016-17 report, the National Chamber of Entrepreneurs still continues in the development of the legislative framework and basic concepts in implementation of dual training in Kazakhstan. An estimate is that by 2019, 80 % of VET colleges will introduce the basic principles of dual training. The Chamber plays an important role in consolidating the efforts of the Ministry of Education and Science and the Ministry of Healthcare and Social Development. The most recent common activities resulted in provision of access to information on vacancies and the labour market in general, which represents a more integrated approach to career management. Currently, more and more employers and business association are involved in the management of VET system in Kazakhstan. In general, the most active enterprises involved in training and improving the quality of VET are large companies from the oil and gas, mining, construction and tourism sectors. The small- and medium-sized enterprises are still less involved in VET activities⁷⁹.

In order to increase VET graduates' entrepreneurial competences, the State Programme of Education and Science Development (SPESD) has scheduled the basic of entrepreneurial activities as an optional subject in VET colleges for the period 2016 to 2019. Under the auspices of the National Chamber of Entrepreneurs, the Youth Entrepreneurship Development Council was established in order to overcome preconceived ideas about barriers of youth entrepreneurship development, as well. SPESD also specifies the establishment of independent industry centres that will certify the qualifications of VET graduates, obtained in non-formal and informal education⁸⁰. According to the recent statistics published by the Ministry of Education and Science, the dual training covered 2 433 businesses, at which 27 thousand students undergo internship at 80 specialties and 160 qualifications. However, these 27 thousand students trained within the dual education represent only 5.5 % of the total number of students⁸¹.

Kazakhstan possesses a well-developed staff development system. However, the opportunities for in-company training of VET staff that could support the introduction of the dual approach are still insufficient. Kazakhstan plans to review competence requirements and training opportunities for VET college managers in the course of 2017.

3.2.2 Kyrgyzstan

The right to education is grounded in the **Constitution of the Kyrgyz Republic**, and the **Law on Education**. Reforms and development of the education system are based in the Decree No 201 **On Strategic Directions of the Education System Development in the Kyrgyz Republic**, released by the Government of the Kyrgyz Republic in 2012. The Decree has approved the Education Development Concept and the Education Development Strategy in the Kyrgyz Republic until 2020. These documents comprise concrete steps for the education system development⁸².

⁷⁹ ETF. 2017. Executive summary of the Torino Process 2016-17 Kazakhstan report

⁸⁰ ETF. 2017. Executive summary of the Torino Process 2016-17 Kazakhstan report

⁸¹ <http://palata.kz/en/news/25681>

⁸² Overview of the Higher Education System, Kyrgyzstan. 2017

The main vision of the **Education Development Strategy** is to ensure the significant improvement of the education system and to provide equal access to quality education. By the Strategy implementation, the education system in Kyrgyzstan will ensure that its citizens will: (i) have strong communication skills; (ii) be able to act independently; (iii) be able use creative and innovative approaches; (iv) to share values of human rights, freedom, gender equality; (v) respect cultural, ethic and political diversity; (vi) "handle general and specialized knowledge and skills that will allow them to be successful in life and labour market"⁸³. The strategy is covering both the HE and VET sectors.

Since Kyrgyzstan is not a formal member of the **Bologna Process**, it is implementing it on a voluntary basis by ad hoc groups under the supervision of the Ministry of Education. Regarding **NQF**, the country is only at the beginning. Kyrgyzstan adopted its **NQF** by Ministerial Order on 17 March 2016 as an important element of the Education Development Strategy. Its objectives are "to enhance transparency of qualifications; facilitate mobility of citizens to other countries; structure and integrate education and training systems in the country; enhance employability; boost lifelong learning; and link qualifications better to the labour market"⁸⁴. Leading institutions of the NQF are Ministries of Education and Science and Labour and Social Development.

Development of the NQF in Kyrgyzstan is strongly dependent on the support of donors, including Tempus (HE), ETF (VET), the Asian Development Bank (ADB), DVV, the Soros Foundation, etc. A significant influence on the development of NQF regarding its structure, functions and learning outcomes plays the EQF and Bologna Process. The NQF in Kyrgyzstan has a 9-level structure, where level 9 is covering highly specialized post-doctoral qualification. SQF in Kyrgyzstan is currently developed in tourism and construction⁸⁵.

The implementation of the NQF is provided by the Ministries, however, the Ministry of Education and Science is more engaged in the NQF. It has developed a Concept for a National Qualification System and initiated work with international donors to develop both the framework and wider system. Unlike in Kazakhstan, the engagement of other stakeholders (beyond institutions) is limited in Kyrgyzstan⁸⁶.

Kyrgyzstan also has a number of good practice cases illustrating close cooperation between individual VET schools and enterprises. The significant progress made in VET represents the introduction of **work-based learning** through piloting an apprenticeship scheme in 2016⁸⁷. Work-based learning became an integral part of VET system in Kyrgyzstan. The most common form of work-based learning are various internships, which is mandatory at all VET levels. However, only a small number of VET schools ensure practical training within the enterprise due to predominance of small and micro enterprises in the country. At system level, the VET Agency and the light industry sector work together on developing a dual approach, where all practical training will take place within a certain enterprise. The pilot phase should run from the 2017/2018 academic year⁸⁸.

3.2.3 Tajikistan

National priorities in the field of education have been formulated in the **National Strategy for Education Development of the Republic of Tajikistan till 2020** and the **Education Action Plan**

⁸³ Education Development Strategy of the Kyrgyz Republic for 2012 - 2020

⁸⁴ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kyrgyz%20Republic%20-%20NQF%20Inventory

⁸⁵ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kyrgyz%20Republic%20-%20NQF%20Inventory

⁸⁶ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Kyrgyz%20Republic%20-%20NQF%20Inventory

⁸⁷ Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmdl=216>

⁸⁸ ETF. 2017. Executive summary of the Torino Process 2016-17 Kyrgyzstan report.

2015 – 2017. The Strategy “is aimed at renewal of the education system, so that education could implicitly perform the mission of the key resource for improving the well-being of the society and citizens, as well as effectively respond to economic challenges of the developing country and globalization process”⁸⁹. The strategy covers both HE and VET.

By the parliamentary decision No 895, the **Law on Training Specialists Based on Labour Market Needs**, has been adopted in 2012. The Law “recognizes the importance of linking VET with the requirements of the labour market and the economy as a whole and also the importance of social partnership for the improvement of VET quality”⁹⁰.

The Lower House of the Tajik Parliament adopted a new **Law on Adult Education** on 26 October 2016. The Law creates for the first time the possibility for individual citizens to have work skills that they have obtained in informal and non-formal settings certified by various state agencies. A significant contribution to this law has been provided by the Policy advice project on Adult Education promoted by the German Federal Ministry for Economic Cooperation and Development, implemented by DVV.

Tajikistan is not a formal member of the **Bologna Process**, so just like Kyrgyzstan, it implements the Process on a voluntary basis by ad hoc groups. Concerning the **NQF**, Tajikistan is only in conceptualising phase. It adopted the Framework in 2012 within the National Education Development Strategy and assumes a transition to competence-based training in VET as well as the complete adoption of an NQF. Currently, the capacities to develop an NQF are lacking. However, Tajikistan has adopted the National Classification of Occupations (NCO) in 2013, which links occupations to qualifications. The NCO consists of 4 level, where level 2 and 3 are covering VET, and level 4 is covering HE⁹¹.

According to Astana Declaration, other important milestones in the education sector development and reforms in Tajikistan: (i) establishment of a Centre for Methodological Support and Quality Monitoring of Vocational Education and Training; and (ii) addressing the quality of education provision through improved teaching, learning assessment and education system management⁹².

In Tajikistan, an inadequate connection between education sector and the labour market has been identified. In order to address this issue, new requirements for professional personnel and quality standards for all educational levels should be formulated and established within close cooperation with potential employers. However, the level of cooperation between VET schools and business sector is considered very weak, and the concept of VET trainees engaging with business has not been sufficiently supported, even though the business skills are considered a key competence for VET trainees⁹³.

Additionally, Tajikistan has no reliable mechanism for the identification of employers' demand for professional skills. Even though the surveys on this issue are conducted and result in lists of required professions, quality analyses of sought-after professional skills are largely lacking⁹⁴.

3.2.4 Turkmenistan

Modernisation of the education system to the level of the developed countries is a declared priority of Turkmenistan. The right to education for all citizens is based in the **Constitution of Turkmenistan**, adopted in 2008.

⁸⁹ National Strategy of Education Development of the Republic of Tajikistan till 2020, 2012

⁹⁰ Torino Process 2014, Tajikistan. 2015

⁹¹ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Tajikistan%20-%20NQF%20Inventory

⁹² Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmdl=216>

⁹³ ETF. 2017. Executive summary of the Torino Process 2016-17 Tajikistan report.

⁹⁴ ETF. 2017. Executive summary of the Torino Process 2016-17 Tajikistan report.

The **National Program of Social and Economic Development of Turkmenistan for the period 2011-2030** foresees the establishment of an education system comparable to developed countries and the increase of the education quality as a precondition for Turkmenistan's growth and competitiveness. In 2013, the **Law on Education** has been adopted in order "to improve the regulatory framework of the Government policy in the education sector"⁹⁵ followed by the **Decree on Improvement of the System of Education in Turkmenistan**⁹⁶.

In 2016, the Government of Turkmenistan adopted the policy to ensure quality education and learning environment. The quality education policy was developed by the Ministry of Education with technical support from UNICEF⁹⁷. The policy aligned with international standards includes five components: (i) inclusiveness of education, (ii) academic performance and compliance with child's life needs, (iii) gender equality, (iv) safe learning environment, and (v) participatory school management.

Turkmenistan is not a member country of the **Bologna Process** and has no particular mechanism supporting its implementation developed. In case of **NQF**, the discussions on the introduction of a qualifications framework system have just started, but no formal actions or decisions have been taken yet. In the country has just begun the development of a certification methodology as part of skills evaluation and the introduction of a quality assurance system. The closer dialogue with the labour environment with the creation of sector councils is also planned⁹⁸.

Some progress has been achieved in the field of **enterprise-based training**. A training centre has been opened in 2016 in the General Electric headquarters in Ashgabat where the company trains Turkmen experts from the Governmental bodies and academia⁹⁹. Korean company Hyundai Engineering has in May 2016 opened 'Welder Training Center' at the ethane cracker plant in Kiyanly where 400 new welders will be trained¹⁰⁰. Other foreign investors in Turkmenistan provide systematic training for new and existing staff as well (e.g. Bouygues Construction opened a training centre in 2009¹⁰¹, Training centre of a German company CLAAS Global Sales GmbH opened in 2012¹⁰²). Training centres are supported also by the Governments of other countries, for example, the Turkmen-India Industrial Training Centre, situated at the Turkmen Architectural and Building Institute, has been upgraded and modernised with the financial Assistance from the Government of India¹⁰³.

3.2.5 Uzbekistan

The right to education for all country's citizens is grounded in the Constitution of the Republic of Uzbekistan. Aside from the Constitution, the legal basis in the field of education comprises: (i) the Law on Education; (ii) the Law on National Programme for Personnel Training; (iii) decrees and resolution; (iv) Education Sector Plan.

The **Law on Education** "determines the legal basis of training, education, professional training of citizens and is aimed at providing constitutional right of everyone on education"¹⁰⁴.

⁹⁵ Overview of the Higher Education System, Turkmenistan. 2017

⁹⁶ Turkmenistan, Overview of Vocational Education and Training and the Labour Market, 2015

⁹⁷ EC (February 2017): Overview of the Higher Education System. Turkmenistan

⁹⁸ Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmdl=216>

⁹⁹ http://www.turkmenistan.gov.tm/_eng/?id=6597

¹⁰⁰ <http://www.businesskorea.co.kr/english/news/industry/14832-welder-training-center-hyundai-engineering-opens-welder-training-center>

¹⁰¹ <http://blog.bouygues-construction.com/en/nos-aventures-humaines/bouygues-construction-ouvre-un-nouveau-centre-de-formation-pour-ses-compagnons/>

¹⁰² <http://www.turkmenistan.ru/en/articles/16891.html>

¹⁰³ <http://www.mea.gov.in/bilateral->

documents.htm?dtl/25456/Joint_Statement_between_Turkmenistan_and_India_during_the_Prime_Ministers_visit_to_Turkmenistan

¹⁰⁴ <http://cis-legislation.com/document.fwx?rgn=846>

The **Law on National Programme for Personnel Training** (adopted in 1997) together with the Law on Education "laid a solid foundation for the creation of a harmonious system of continuous education of the modern type"¹⁰⁵.

The President's decree of July 28, 2010 "**On additional measures to involve graduates of educational institutions in entrepreneurial activities**" enables small and micro enterprises to increase the number of their staff by as much as 50 % beyond the limit if they employ graduates of vocational colleges, academic lyceums, and HEIs. Provided that additional staff members are fresh graduates of VET and HE, the economic entity will retain all the benefits and guarantees provided for micro-firms and small enterprises.

In order to support young professionals to engage in entrepreneurship, the **law of December 4, 2014, No. ZRU-379** introduced amendments to Article 375 of the Tax Code regarding the procedure for payment of a fixed tax by individual entrepreneurs. The Article established the concept of tax exemptions, provided to VET graduates wishing to register as individual entrepreneurs. They are exempted from paying a fixed tax for a period of six months from the date of their state registration as an individual entrepreneur, but only on condition that their state registration was produced within twelve months after graduation from the vocational college. If the graduate stops the entrepreneurial activity within twelve months from the date of state registration as an individual entrepreneur, he/she will be obliged to pay a fixed tax for the entire period of activity.

An important legislation is the Decree of the President of the Republic of Uzbekistan Shavkat Mirziyoyev of 27th July 2017 No. PP-3151 "**On measures to further expand the participation of industries and economic sectors in improving the quality of training of specialists in higher education**" aiming to strengthen the cooperation among education, science and business in ensuring highly qualified experts for the needs of Uzbek economy. This should be achieved through (i) organisation of apprenticeships and enterprise-based learning for HEI students, (ii) increased involvement of university researchers in contract-based research for companies, and (iii) higher internationalisation opportunities for talented young teachers and doctoral students.

In January 2018, president Shavkat Mirziyoyev signed a decree "**On Measures for Improvement of the System of Secondary, Secondary Specialized and Vocational Education**" in order to improve those education sector based on experience of developed foreign states, and to create conditions for training highly skilled specialists. According to the decree, the most important tasks of the system of professional training and vocational education are training in professions demanded in the job market considering the priorities and prospects of economic development, modern trends in qualified middle-level specialists with practical professional skills, including information technologies related skills.

To introduce improvements in governance and management of HE providers in the area of IT, the **presidential decree № UP-5349 19.02.2018** was released in February 2018. The decree approves the proposal of the Ministry of Higher and Secondary Special Education on the introduction of the Tashkent University of Information Technologies, including its branches, from the 2018/2019 school year of the credit training system for training personnel in the field of information technology and communications. The decree has a very high value for the educational system in Uzbekistan, as it allows decentralization in the system of educational standards, and thus adding flexibility to HE providers to set its own programmes. This should improve involvement and cooperation of business sector in the field of employability of graduates as well as to have in the field of educational programmes development.

The **Education Sector Plan** was developed in 2013, and it is "built on the model of life-long education, aimed at ensuring equal opportunities and quality education for all"¹⁰⁶. It covers both,

¹⁰⁵<https://www.un.int/uzbekistan/news/uzbek-model-education-key-achieve-goals-sustainable-development>

the VET and HE sectors. The strategic vision within the VET sector is that teachers will be “prepared for the transmission of knowledge, independent thinking and organizational skills to learners, and for the development of learners’ personalities in preparation for their contribution to society”, and within HE that graduates will be “prepared as highly qualified specialists to contribute to scientific progress, socio-economic and cultural development”¹⁰⁷.

Draft Lifelong Learning Strategy of Uzbekistan has been almost finalised by the end of 2016¹⁰⁸. Support has been provided by UNESCO Office in Tashkent, the UNESCO Institute for Lifelong Learning and the International Office of the German Adult Education Association (DVV) in Uzbekistan.

Uzbekistan is not a member country of the **Bologna Process** and has no particular mechanisms supporting its implementation developed yet. The qualifications initiatives in the country are in hands of the Ministries of Public Education and Higher and Secondary Specialized Education. However, development of the NQF is only at the ad hoc stage, considering the EQF and the Bologna Process in the education sector development. Even though a formal NQF does not exist in the country, there are NQF-type instruments established, such as the **State Educational Standards**, which define requirements for the quality of personnel training, content of education, necessary level of training of students, qualification requirements of graduates, etc., and **National Classifiers of Directions and Specialties of Higher Education**, under the unified system of classification and coding of information. Both instruments “provide a structure of defined and validated qualifications, awarded at defined levels and specify how qualifications relate to each other and thus how a learner can progress between them”¹⁰⁹.

Among public institutions, there are other stakeholders engaged in the development of country’s qualification system, including students, parents, employers and professional associations. These stakeholders have already supported update of VET curricula and provision of advisory services of employers¹¹⁰. Since 2015, Uzbekistan has a system of work contracts between enterprises, local communities, schools, and students (so-called “four-party” contract). Uzbek HEIs provide assistance in finding jobs to as many graduates as possible. They organise regular meetings and activities with the participation of potential employers, ensure participation of employers during final examination and organise job fairs jointly with local authorities¹¹¹.

ETF acknowledged the strong support for the VET system provided by the business community but stress the need to continue developing its role as an active contributor to the reform process, particularly in relation to: (i) matching skills requirements for emerging sectors to vocational education (teaching, learning, assessment and career guidance) in the secondary education sector; (ii) providing guidance and support to national and regional authorities on skill needs; (iii) supporting small business in the vocational education system¹¹².

Engagement of business sector in the VET system is highly developed in Uzbekistan. During the period 2015 – 2016, business sector participated in implementation of programmes aimed at improving employability and employment of VET graduates, in elaboration of new professional standards for emerging VET sectors, and in development of small businesses and entrepreneurship in VET system¹¹³.

¹⁰⁶ Education Sector Plan, 2013

¹⁰⁷ Education Sector Plan, 2013

¹⁰⁸ <http://www.uil.unesco.org/lifelong-learning/recognition-validation-and-accreditation/towards-lifelong-learning-strategy>

¹⁰⁹ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Uzbekistan%20-%20NQF%20inventory

¹¹⁰ https://connections.etf.europa.eu/wikis/home?lang=en#/wiki/Wf591e43b607e_4ccf_8d94_a3256a255147/page/Uzbekistan%20-%20NQF%20inventory

¹¹¹ Astana Declaration of the Second Meeting of Ministers for Education of the Member States of the European Union and of the Central Asian Countries. 2017. Available online: <http://events.caep-project.org/astana2017/download/astana-declaration/?wpdmdl=216>

¹¹² ETF (2015): Torino Process 2014: Uzbekistan

¹¹³ ETF. 2017. Executive summary of the Torino Process 2016-17 Uzbekistan report

4 Good Practice for Existing Cooperation Schemes

This central part of the study reviews existing financial instruments supporting the cooperation among private enterprises and educational institutions, both in the EU and Central Asia. Section 3.2 presents more than 20 case studies illustrating the examples of good practice in EU Member States and five Central Asian countries.

4.1 Existing programmes

Programmes in the EU

Collaboration between business and educational institutions in the European Union is promoted in the first place by the European structural and investment funds (ESIF). All ESIF funds are managed by Member States themselves, by means of partnership agreements. Each country prepares an agreement, in collaboration with the European Commission, setting out how the funds will be used during the current funding period 2014-20. Based on the agreements, each EU Member State designs several investment programmes channelling the funding to the different regions and projects in policy areas concerned. The biggest part of the EU support to cooperation among education and business is provided by the European regional development fund (ERDF) and the European Social Fund (ESF).

ERDF promotes balanced development in the different regions of the EU in order to strengthen economic and social cohesion in the EU. For instance, in Slovakia the ERDF funding in 2014-2020 amounts to more than €7 billion. This allocation will be used, inter alia, for investments into research and innovation projects which aim to provide the new technologies needed to implement intelligent solutions. It will also strengthen the cooperation between the higher education institutions and business, particularly through the interventions of the Operational Programme Research and Innovation (OP R&I)¹¹⁴. The Programme aims to enhance innovation activity and the competitiveness of enterprises in order to increase their added value, stimulate growth and job creation and improve the performance of the research and innovation (R&I) system. It will mobilise private investments in R&I and promote cooperation between research organisations, higher education and the business sector. The OP R&I covers all regions in Slovakia and is the main tool for implementing the country's Strategy for Smart Specialisation.

ESF is Europe's main instrument for supporting more and better jobs. It is funding tens of thousands of local, regional and national employment-related projects throughout the Europe. Coming back to the example of Slovakia, ESF Operational Programme Human Resources 2014 - 2020 aims to boost employment among its young people and improve education and training opportunities, e.g. through the project of National Centers for Apprenticeship – Introduction of Elements of Dual Vocational Education and Training in the Slovak Republic¹¹⁵. It is a Flagship

¹¹⁴ <https://www.minv.sk/?operational-programme-research-and-innovation-2014-2020> ; http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/slovakia/2014sk16fop001

¹¹⁵ <https://www.minedu.sk/national-authorities-for-apprenticeships-introduction-of-elements-dual-vet-slovak-republic/>

project of the European Union Strategy for the Danube Region. The objective of the project is to contribute to a complex reform of the VET system towards more practical work-based education.

Another important instrument is **Erasmus+**, the EU's programme to support education, training, youth and sport in Europe with the budget of €14.7 billion for 2014 - 2020. The aim of Erasmus+ is to contribute to the Europe 2020 strategy especially for growth and jobs creation. It offers opportunities for a variety of individuals and organisations under 3 key actions (KA1 Learning mobility of individuals, KA2 Cooperation for innovation and the exchange of good practices, KA3 Support to policy reform). Key Action 2 aims to support innovative practices and joint initiatives to promote cooperation, peer learning, and exchanges of experiences. Strategic partnerships created under this programme include a wide range of public, private, and non-governmental organisations to implement various activities. The QUAL-IM-G project¹¹⁶ is a good example of the cross-border partnership including several professional organisations, training institutions, counselling agencies and universities. It will produce sustainable and transferable outputs¹¹⁷ that will directly strengthen the implementation of quality assurance in career guidance not only in partner countries, but also in other national contexts and transnational organizations.

Majority of EU Member States invest into the cooperation between private companies and educational institutions significant resources from their national budget as well. The business-education cooperation in **France**, for example, is financed by the apprenticeship tax, paid by enterprises, amounting to 3 billion euros annually. The apprenticeship tax is collected by designated chambers (e.g. Chambers of Commerce and Industry), inter-professional organizations (e.g. SMEs organization AGEFA PME) and sectoral organizations (e.g. ANFA - National Association for Automobile Training). Collected tax is being disbursed among the Apprentice Training Centers, Technological Platforms or HE and VET institutions (e.g. the tax represents as much as 22% of the income of ESSEC private business high school group). The best example for business – education cooperation are the technological platforms co-financed by the apprenticeship tax (see the 3D Innov Technological Platform described in the case study 'L'Atelier Tuffery - Lycée Jean-Baptiste Dumas d'Alès).

Programmes in Central Asia

Collaboration between business and educational institutions is a declared governmental priority in all Central Asian countries and as such is eligible for national public funding. In many cases, cooperation mechanisms are fully or partially financed by companies that invest their own resources into the joint projects with universities or colleges. However, an important part of cooperation schemes among business and HE/VET institutions in Central Asia has been launched or supported through the projects of international development partners, albeit often only as sub-components of broader structural interventions. In this section we briefly review the most relevant programmes of major European donors.

Main channels of the **EU support** are the current opportunities offered by Erasmus+, its predecessor Tempus, and the development cooperation projects financed from DG DEVCO. Examples of projects having successfully implemented university business cooperation under Tempus IV include¹¹⁸:

- 544126-TEMPUS-ES-JPHES (2013) – UNIWORK: Strengthening Career Centres in Central Asia Higher Education Institutions to empower graduates in obtaining and creating quality employment (KG, KZ, TJ, TM, UZ). Please see the UNIWORK case study in the following section of the report.

¹¹⁶ <http://bksuspech.sk/new/qual-im-g/>

¹¹⁷ <http://guidancequality.eu/project-outputs/>

¹¹⁸ Relevant projects identified by the EC - Education, Audiovisual and Culture Executive Agency

- 543746-TEMPUS-ES-JPHES (2013) – INOCAST: InnoLabs in Central Asia for a sustainable catalyzation of innovation in the Knowledge triangle (KG, KZ, TJ, TM, UZ).
- 544529-TEMPUS-LV-JPCR (2013) – Modernisation of higher education in the area of food quality and safety in Tajikistan (TJ only).
- 543922-TEMPUS-SE-JPCR (2013) – MACH: Introduction of new Master programme and doctoral courses in Mechatronics in Uzbekistan (UZ only).
- 544573-TEMPUS-BG-JPHES (2013) – MATCHES: Towards the modernisation of higher education institutions in Uzbekistan (UZ only).

Two more relevant projects have been identified under the Erasmus+ Capacity Building in Higher Education (Key Action 2):

- 561495-CBHE-AT-JP (2015) – Implementing a Central Asian Centre for teaching, learning and entrepreneurship (involving KG, KZ, UZ)
- 561832-CBHE-LV-SP (2015) – European dimension in qualifications for the tourist sector (involving KG and RU)

DG DEVCO supports from the DCI envelope several development cooperation projects that include interventions aiming to enhance cooperation among business and education. The most important projects are 'Support to the reform of the education sector in the Kyrgyz Republic' (17 Mil. EUR, 2013-2018) aiming to enhance synergy between the labour market needs and the skills and qualifications offered by VET; 'Quality Education Support Programme I' in Tajikistan (15 Mil. EUR, 2017-2020) aiming to enhance overall labour market relevance of education; and the 'Support to the Education Sector in Turkmenistan' (4,6 Mil. EUR, 2016-2020) fostering further reforms of education sector. DG DEVCO also commissioned the policy dialogue project Central Asia Education Platform II covering both HE and VET in all five CA countries.

The reforms of the VET sector in Central Asian countries are supported also by the **European Training Foundation (ETF)**. A key tool for dialogue on the status of VET reforms across partner countries is Torino process, reviewing – among other aspects – the cooperation between education and business (for more information please see chapter 2.2 of this report). ETF also implemented a "skills connexion" project in Kazakhstan focusing on work-based learning and supported the institutionalisation of a tracer study methodology for VET in Kyrgyzstan (in cooperation with the ADB).

An example of a bilateral programme is the 'University-Business-Partnerships between Higher Education Institutions and Business Partners in Germany and in Developing Countries' funded by the **German Academic Exchange Service (DAAD)**. The aim of the programme is to support the transfer of knowledge between universities and industry so that graduates are better suited to the needs and developments of the labour market¹¹⁹. Up to now, only one project has been implemented in Central Asia: 'Enhanced Practical Orientation of the Study in Kyrgyzstan and Georgia'. The project is led by the Westsächsische Hochschule Zwickau and co-implemented by 5 technical universities and 3 private companies in Kyrgyzstan, 2 universities and 1 enterprise in Georgia and 6 German companies.

Another German initiative is the developPPP.de programme, commissioned by the **German Federal Ministry for Economic Cooperation and Development (BMZ)**, that provides companies investing in developing and emerging countries with financial and, if required, also professional support. The company covers at least half of the overall costs; BMZ contributes up to a maximum of EUR 200,000. BMZ has appointed three public partners to implement the programme on its behalf:

¹¹⁹ <https://www.daad.de/der-daad/unsere-aufgaben/entwicklungszusammenarbeit/foerderprogramme/hochschulen/infos/en/44507-university-business-partnerships-between-higher-education-institutions-and-business-partners-in-germany-and-in-developing-countries/>

DEG – Deutsche Investitions- und Entwicklungsgesellschaft mbH, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and sequa gGmbH. Companies taking part in developPPP.de always cooperate with one of these public partners. Since the launch of the programme in 1999, DEG, GIZ and sequa have realised over 1,500 development partnerships with German and European companies. Companies are invited to register their interest with DEG, GIZ or sequa by participating in one of the ideas competition held four times a year. These are open to all German and European companies and their subsidiaries in developing countries and emerging economies¹²⁰. For an example of a project implemented in Central Asia please see the case study 'Enterprise-based Learning in Eastern Kazakhstan' reviewing the cooperation among the energy producer AES Kilroot Power Ltd., D. Serikbayev East Kazakhstan State Technical University and Ust-Kamenogorsk Polytechnical College.

French initiative "Campus Pro International"¹²¹ commissioned by the French Ministry of National Education (MNE) is based on a tripartite partnership between the MNE, companies wishing to support their international development with training initiatives and the partner countries that host them. On the basis of this relationship the Centers of Excellence for Technical Training Abroad are created. Each of the partners provides a specific contribution: the MNE provides high-level experts, the host country provides premises, teaching staff and logistics and the company brings along the technical platform. Since 1998, 25 training centres for technicians have been created in 12 countries, mainly through partnerships with major industrial companies: Safran-Eurocopter (Mexico, Brazil, ...), PSA-Peugeot Citroën (Latin America, China, Malaysia), Accor (Mexico), Dassault Systemes (Latin America, South Africa, India, ...), Schneider Electric (Latin America, India, Kazakhstan), Renault (Venezuela, Colombia). These partnerships promote the education-business relationships and are concretized by an agreement between the MNE, the educational entity of the third country and the French company. In order to develop desired skills, the partnership typically modifies an existing curriculum or creates a new one. Mobility of experts and students is promoted as well. Students appreciate particularly the attractiveness of the training and the teaching of French language. **The Centre KazFETS – Schneider Electric in Kazakhstan**¹²² is the only partnership in Central Asia benefitting from this programme. KazFETS – Schneider Electric is a training center for academic and professional excellence in the field of low electrical voltage and automated systems. It is based on a partnership established in 2010 between the Kazakh National Technical University, French Ministry of National Education, Schneider Electric Company and Schneider Electric Foundation. Total investment was worth nearly 2 million EUR. The Centre is located within the Kazakh National Technical University. In its fifth academic year, the center hosted 400 students and opened new training modules for employees of Kazakh businesses and HEIs (continuous VET).

Kazakhstan is at the same time the only Central Asia country benefitting from the 'Industry Academia Partnership Programme' offered by the **UK's Royal Academy of Engineering**.¹²³ As a delivery partner of the Newton Fund, the Academy partnered with the Kazakh National Agency for Technological Development to enhance engineering teaching, research and innovation capacity in Kazakhstan through building bilateral industry-academia linkages. The following projects have been supported since 2015¹²⁴:

¹²⁰ <https://www.developpp.de/en/content/das-programm>

¹²¹ <http://www.education.gouv.fr/cid55704/le-partenariat-ecole-entreprise-a-l-international.html>

¹²² <http://www.culturefrance.kz/Centre-de-formation-Schneider-Electric-KazFETS>

¹²³ <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/industry-academia-partnership/industry-academia-partnership-kazakhstan>

¹²⁴ [https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/industry-academia-partnership/industry-academia-partnership-kazakhstan/industry-academia-partnership-china-\(1\)](https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/newton-fund-programmes/industry-academia-partnership/industry-academia-partnership-kazakhstan/industry-academia-partnership-china-(1))

Lead Kazakh University	Kazakh Industry Partner	UK Partner	Project Title
National Laboratory Astana, Nazarbayev University	Mast Carbon	Mast Carbon	A Medical Device Based on Activated Carbon Monolith
National Laboratory Astana, Nazarbayev University	Romat Ltd	University of Brighton	Wound dressings for malodorous chronic ulcers
Nazarbayev University Research and Innovation System	Atyrau Oil Refinery Plant	University of Manchester	Demonstration of advanced energy system optimization methods on an industrial chemical (petrochemical) facility in Kazakhstan for high energy and cost efficiency on process industries
King Al-Farabi Kazakh National University	Jaylyn Ltd	University of Brighton	Surface Functionalised Nanostructured Carbon Sorbents for Health and the Environment
Eurasian National University	Kazhydromet	Northumbria University	Improved snowmelt runoff-modeling and flood hazard mitigation in Kazakhstan using physically-based modelling and remote sensing data
Innovative University of Eurasia	Bo-Na LLP	University of Brighton	Nanomaterials engineering for environmental remediation: deep decontamination of the Lake Byklydak from mercury
Eurasian National University	Almaty Academy of Economics and Statistics; BASCK; AGARR	Innovation Action/ University of Cambridge	Developing Industry Academia Links /University Partnerships (DIAL UP)
National Laboratory Astana, Nazarbayev University	Kazakhstan Utility Systems LLP	Cranfield University	Increase of energy efficiency in Combined Heat and Power (CHP) plants using state-of-the-art optimization methods: Case study in LLP KUS.
Al-Farabi Kazakh National University	Institute of Nuclear Physics; Romat Ltd	University of Reading	Developing radiation technology for manufacturing hydrogel wound dressings with antimicrobial activity
Nazarbayev University	Garysh Sapary	Leica uk	Design and development of the GNSS geodesy training and research polygon, cooperation program of the Leica UK, Nazarbayev University, and Gharysh Sapary, Kazakhstan
Al-Farabi Kazakh National University	JSC "Almaty Power Station"/ Republican Institute for development of leading and research-pedagogic staff	Newcastle University	Enhanced capacity of engineering educators within Kazakhstan universities to teach course content and use novel pedagogical methods to up skill graduates
Kazakh-British Technical University	"EMC Information Systems Kazakhstan" LLC	University of Southampton; University of Cambridge; Leeds Beckett University	KBTUthinkIT infrastructure for collaborative knowledge-sharing in IoT
Nazarbayev University	JSC KazChrome	University of Sheffield	Investigation of municipal solid waste blending effect on reactivity of coals in circulating fluidized bed combustion and gasification processes

4.2 Examples from the EU

In this section we present examples of the cooperation between business and education in various EU Member States. For each example, one or more categories of the cooperation (corresponding to the categorisation outlined in chapter 1.2) are marked in the checkboxes.

4.2.1 Corporate Partners Club at the Warsaw School of Economics

<i>Country</i>	Poland	
<i>Name of the university/ VET school + Name(s) of business</i>	SGH Warsaw School of Economics Accenture, Bank Millennium, Bank Pekao, Bank Zachodni, WBK/Santander Universidades, DB Schenker, Deloitte, EY, Warsaw Stock Exchange (GPW), ING Bank Śląski, KPMG, Mastercard, McKinsey & Company, L'Oréal, PKO Bank Polski, Procter & Gamble, PwC, PZU.	
<i>Implementation period</i>	1998 – now	
<i>Source of funding</i>	Private funding	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input checked="" type="checkbox"/> Management cooperation <input checked="" type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

SGH Warsaw School of Economics is the oldest and the highest-ranked university of economics and management in Poland. Its history dates back to 1906. Its mission is to educate economists and business leaders serving the nation, the country and the region. SGH is famous for its tradition, flexible adjustments of programmes to students' needs, unquestionable education level, and successful alumni.

SGH Corporate Partners Club was founded in 1998 to unite both Polish and international companies for cooperation with the SGH. The aim of this cooperation is to advance the practical aspects of education, increase the employability chances of students and alumni and increase quality of studying and leisure time on campus. Membership in the Club means joining prestigious circle of companies supporting development of the University and connection between business practice and theory.

Main areas of cooperation within the Corporate Partners Club include:

- **Employer branding and recruitment** – including activities such as promotion events, meetings and workshops for students, as well as recruiting campaigns and internship offers. These events help companies to attract talents, achieve their HR and employer branding goals on the one hand, and, on the other hand, provide attractive opportunities for students.

One of the effects of the constant presence of the companies at SGH is that students become familiar with their potential employers.

- **Education and research** - corporate partners enrich SGH's curriculum. Students may take part in various seminars, workshops as well as educational programmes, or lectures created and delivered by companies together with the faculty members. Examples of academic-business programmes are 'Brand management in a multinational company' created with Procter & Gamble and 'Strategy Development in Practice' created with McKinsey&Company. The companies may participate at on-campus lectures or seminars as well as organise practical lectures in companies and study visits. They are encouraged to propose diploma thesis and assist students in processing it. SGH is currently preparing for implementation of dual studies programmes, too.
- **Infrastructure** - support and investment in development of University's infrastructure is one of the most visible effects of companies' engagement in the cooperation. Besides the patronage over lecture rooms (e.g. Mastercard, Procter & Gamble, DB Schenker and other), the companies invest in projects like renovation of the sport hall (Deloitte), renovation of the Undergraduate Studies Office and enhancement of student service (Bank Zachodni WBK/ Santander Universidades), development of student identity cards with payment option (Bank Pekao), Coworking Centre (Bank Millennium).
- **Social involvement projects** - SGH is currently discussing the opportunities for collaborative projects for local and academic communities, e.g. open lectures.

There is a continuous stakeholder dialogue at the strategic level through the SGH Corporate Partners Club Council. It is an advisory body consisting of presidents of the boards and board members, directors and top management from the cooperating companies which support directly Rector and other SGH Authorities. They represent employers and share their opinions and comments on SGH plans, strategy, programmes, giving a valuable substantial contribution.

The SGH is continuously developing and improving Club's activities with strong attention to the needs of each individual company and it is open to new ideas and proposals. Relationships with its Partners are based on long-term commitment and seeking for benefits for all stakeholders and looking for synergy in the company-students-university system.

4.2.2 North American Studies at the University of Economics in Bratislava

<i>Country</i>	Slovak Republic	
<i>Name of the university/ VET school + Name(s) of business</i>	Center for North American Studies of the University of Economics in Bratislava The American Chamber of Commerce Dell Lenovo	
<i>Implementation period</i>	2008 - now	
<i>Source of funding</i>	The University of Economics in Bratislava	
<i>Cooperation category</i>	<i>Higher Education:</i> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research	<i>VET:</i> <input type="checkbox"/> Curricula development or adjustment

	results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development
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Narrative description:

The Center for North American Studies (CNAS) of the University of Economics in Bratislava is a regional center whose mission is to disseminate knowledge about the countries of North America and to promote the relations of the University of Economics in Bratislava with universities, enterprises and other institutions in the United States of America and Canada¹²⁵.

CNAS currently offers a unique training programme in Slovakia, where candidates can gain extensive knowledge of political, economic and cultural aspects of life in the North America. For each academic year, CNAS offers approx. 10 accredited elective courses, each taken by an average of 20 students. Courses have a form of seminars and practical workshops in English. Courses with at least 18 hours per semester are worth of 3 ECTS credit points, awarded to students upon completion of the course¹²⁶.

Duration of each course is from 6 to 12 weeks, and in some cases, it can be extended by internships possibly resulting in a job offer for students. The primary target groups are Bachelor and Master's students of humanities and economic science of the University of Economics in Bratislava, but any enthusiastic students and graduates of all faculties from Slovakia and abroad who wish to increase their professional and practical competencies are welcome to apply¹²⁷.

For academic year 2017/2018, CNAS offers, for example, the following courses:

- **American Business Culture and Ethics** – provides students with the knowledge and practical experience of particularities of the American business culture and the influence of ethics on economic relations. The course is a combination of theoretical approaches with practical case study methods, and its main topics include: (i) managing stakeholder and governmental relationships, (ii) PR and communication, (iii) Managing HR, (iv) Corporate social responsibility;
- **HR in American Practice** – provides students with an in-depth look at key roles of HR in large companies. The real-life systems and processes are presented to students by HR professionals from international companies associated within the American Chamber of Commerce in Bratislava through case studies. Main topics of the course include: (i) Recruitment and interview process, (ii) Training and development of employees, (iii) Performance management, (iv) Talent management, (v) Exit management (restructuring, laying off);
- **Interpersonal Managerial Skills: Lenovo Case Studies** – provides students with interpersonal skills that lie at the core of working at a large multinational company through highly practical training that Lenovo offers its managers and top talents. The course has a role-play-oriented structure with solving real Lenovo's communication case studies. The course comprises some of the following topics: (i) personal branding, (ii) writing effective e-mails, (iii) basics of cultural intelligence, (iv) career advice, (v) time management;

¹²⁵ <http://cnas.sk/>

¹²⁶ https://ub-cooperation.eu/pdf/cases/E_Case_Study_Bratislava.pdf

¹²⁷ <http://skolskyservis.teraz.sk/vysoke-skoly/centrum-severoamerickych-studii/25732-clanok.html>

- **Managing Global Business: Dell Case Studies** – introduces students the functioning of a global company and its success story and specifics of its operations on the global market. Discussion on certain strategic areas (such as direct model, brand, remote management) allow students understand these aspects and how they are important for global companies. Field trip to Dell in Bratislava is a practical part of the course;
- **Innovation Management in Small Enterprises** – the course provides a forum for in-depth examination of mindsets, methods, and activities that make up the entrepreneurial process, such as opportunity recognition, founding, growing the new venture. The most important outcomes of this course are the development of business plan and business model¹²⁸.

These courses are important for graduate's transition to the labour market and professional success, since they provide students with up-to-date knowledge and experience from the business world, and enhance their soft skills. The most prominent feature of the courses is that they are developed and led by academics from Slovakia and North America in close cooperation with representatives from the business sector, especially from global companies such as Dell, IBM, Adient, Lenovo, AT&T, O2, and Amazon. These courses also help to build a positive image of the University of Economics in Bratislava, which is considered a partner to business sector thanks to their daily cooperation. In a broader sense, these courses serve as a model for other universities in Slovakia, and to American Chamber of Commerce as examples of good practice for decision-makers in the field of university-business cooperation¹²⁹.

4.2.3 Team Academy at the Jyväskylä University of Applied Sciences

<i>Country</i>	Finland	
<i>Name of the university/ VET school + Name(s) of business</i>	Jyväskylä University of Applied Sciences (JAMK)	
<i>Implementation period</i>	1993 - now	
<i>Source of funding</i>	Government	
<i>Cooperation category</i>	<i>Higher Education:</i> <input type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<i>VET:</i> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Tiimiakatemia is the entrepreneurship centre of excellence of the University of applied sciences in Jyväskylä (JAMK), founded in 1993 by Johannes Partanen, the enthusiastic marketing lecturer. Team Academy offers a unique Bachelor course with no classrooms, no lectures, and no exams, but open offices, team coaches and students managing real companies instead. The educational process

¹²⁸ <http://cnas.sk/kurzy/>

¹²⁹ https://ub-cooperation.eu/pdf/cases/E_Case_Study_Bratislava.pdf

is a combination of the world of business and education which provides students with experience obtained through practice and experimentation resulting in more effective learning¹³⁰.

Team Academy exists within the JAMK structure, on a 1 000 m² open space over two floors, rented from the University. The first floor of Team Academy comprises working/office spaces, the second floor comprises training rooms and silent spaces. Furniture, educational equipment, and other materials are provided by JAMK. Team Academy receives government funding based on the number of students, however, students usually have to apply for low-interest student loans to fund their study¹³¹.

Team Academy is a three-and-a-half-year Bachelor programme with graduating students emerging with a Bachelors of Business. On the beginning of the programme, teams of approx. 20 students are formed and given the task of developing real businesses which will generate income. During the first year of study, students gain a basic economic education, including management, leadership, marketing, etc. After the first year of the undergraduate business economy, they start implementing their business ideas. In a real-life business environment, students learn finance, marketing, leadership and business strategy by working on real projects from organizing events to running retail outlets. At the end of the programme, students use the profit generated by their companies for a six to eight-week world-trip¹³².

The central component of Team Academy is the Teamcompany, an independent company created by students which combines both learning and business environment. Teamcompanies are legal entities and they pay corporate taxes like all companies in Finland. However, Teamcompanies are fully owned by the Teampreneurs and are independent from the Team Academy Finland as a juridical entity. Teamcompanies can also serve as incubators, as new product and service innovations created within Team Academy have frequently led to students continuing as independent entrepreneurs in new businesses after graduating¹³³.

Within Teamcompanies, students are encouraged to visit their customers, create networks with companies and other people in order to succeed in their business and earn money for their investments. In some cases, the older companies lend money to younger ones. Instead of traditional lessons, students have coaching lessons (2 x 4 hours per week) where the team's coach offers ideas and advice upon request. Team coaches are mentors supporting students' teams as well as individuals through their educational pathway and the practical concept development, but they do not finance the Teamcompanies. Coaches are usually either Team Academy graduates or have had previous entrepreneurship and business experience. They are paid by the JAMK¹³⁴.

Team Academy has a variety of benefits. Through the Team Academy, JAMK seeks to enhance its reputation within Finland and beyond, to increase student employability, get academia closer to practice and students closer to employers as well as to develop more entrepreneurial mind-sets. On a regional level, Team Academy aims to develop a local entrepreneurship ecosystem whilst developing students capable of employing themselves and others. Team Academy has earned a positive reputation amongst high schools, with upper secondary school teachers reporting that many of their active students already knew about Team Academy and wanted to apply as soon as they graduate¹³⁵.

The success of Team Academy can be simply expressed in numbers. From the beginning of its existence, Team Academy created 83 team entrepreneurs which created a combined turnover of 2,3 million Euros in 2016. Statistically, 91 % of Team Academy students find a job within 6 months

¹³⁰ https://ub-cooperation.eu/pdf/cases/N_Team_Academy.pdf

¹³¹ https://ub-cooperation.eu/pdf/cases/N_Team_Academy.pdf

¹³² <https://opinto-oppaat.jamk.fi/fi/opinto-opas-amk/tutkinto-ohjelmat-ja-opintotarjonta/suomenkieliset-opsit/2018-2019/tiimiakatemia/>

¹³³ https://ub-cooperation.eu/pdf/cases/N_Team_Academy.pdf

¹³⁴ <http://www.tiimiakatemia.fi/en/tiimiakatemia/journey-learn/>

¹³⁵ https://ub-cooperation.eu/pdf/cases/N_Team_Academy.pdf

after graduating, 37 % of them become entrepreneurs 6 months after graduating, and 47 % of them become entrepreneurs 2 years after graduating¹³⁶.

Team Academy of JAMK has become the flagship for a movement which is spreading around the world. Team Academy became “a learning community created with the specific aim of giving young adults the skills, knowledge and personal qualities required to run their own businesses while at the same time getting a university degree”¹³⁷. Team Academy methods incorporated into undergraduate programmes, post-graduate spin-offs and adult education programmes are currently implemented at universities in Spain, Hungary, Netherlands, France, Brazil, Argentina and Australia¹³⁸.

4.2.4 Strategic R&D Cooperation in Latvian Glass Industry

<i>Country</i>	Latvia	
<i>Name of the university/ VET school + Name(s) of business</i>	GroGlass Solid State Physics Institute of the University of Latvia Riga Technical University	
<i>Implementation period</i>	2011 - now	
<i>Source of funding</i>	GroGlass budget National and EU grants	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input checked="" type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

GroGlass is a Latvian medium-sized company with approx. 150 employees and it is one of the leading companies in developing and manufacturing anti-reflective and other high-performance coatings on glass and acrylic for high-end electronic and static displays, picture frames, museum showcases, etc. R&D of the company is undertaken mostly in cooperation with Latvian universities and research centres. The greater scale of cooperation started in 2011 with the University of Latvia and its Solid State Physics Institute (SSPI) by providing specific analyses and product tests for GroGlass. The cooperation with Riga Technical University has started in 2016 based on company's different implementation methods of various kinds of coating technology, including chemical processes¹³⁹.

Cooperation between GroGlass and SSPI is formalized under a framework agreement, but many practical issues are solved through direct contacts between scientists. Usual initiator of the

¹³⁶ <http://www.tiimiakatemia.fi/en/>

¹³⁷ <http://www.akatemia.org.uk/what-is-team-academy/>

¹³⁸ <http://www.akatemia.org.uk/what-is-team-academy/team-academy-worldwide/>

¹³⁹ <https://www.groglass.com/about/>

cooperation is GroGlass since it needs new relevant data more urgently. Particular research cooperation lasts usually from few months (i.e. improving existing products or solving current problems) to few years (i.e. developing a coating on organic glass), but there are also some minor one-week projects aimed at measuring samples¹⁴⁰.

The core of the cooperation lies in sharing resources: **(i) human capital** – GroGlass' provides engineers and staff from various departments, the SSPI provide its top-level scientists, researchers (and partly students). Technical staff working with particular laboratory equipment and students are provided by both sides; **(ii) material and equipment** – material used are different samples provided only by GroGlass, SSPI only carries out research on existing ones. Main tests and measurements are made in the SSPI laboratories, using their equipment. The excellent equipment of the SSPI is one the key reasons behind the cooperation¹⁴¹.

The research cooperation is also focused on University students. GroGlass and SSPI provide them **training**, mainly in the area of measurements. Additionally, GroGlass occasionally provides financial support for students, for instance for preparing their thesis or attending scientific conferences, and thus motivates them for future work in science and industry. In some cases, students can also complete their practical part of the study in GroGlass and eventually find a job there¹⁴².

This R&D cooperation has obvious benefits for each party involved. The main benefit for GroGlass are new or improved products. Moreover, provided analyses and tests can contribute to the improvement of the whole production, make it more stable, efficient and quality. For individual scientists, researchers and students, cooperation activities represent the source of new skills, knowledge and practical experience. Students gain a comparative advantage at the job market, some of them can even become an employee in GroGlass after graduation; scientists and researchers grow professionally. In a more broader sense, the SSPI builds its image as a respected R&D institute and improves its competitiveness at the European market. Even though the intellectual property remains in GroGlass, SSPI can obtain connections to other projects, experts and companies through this cooperation¹⁴³.

Besides its cooperation with Latvian HEIs, GroGlass has similarly cooperated with several outstanding universities and research centers worldwide, such as:

- **Wageningen University and Research Centre (Netherlands)** – examples of specific cooperation: (i) Research on the impact of anti-reflective glass on greenhouse microclimate and photosynthesis process of the plants; (ii) Measuring of optical properties of large-size coated glass on specially designed equipment; (iii) Equipping test greenhouses with GroGlass AR coated glass for horticultural (crop management, physiology, and modeling) and environmental durability tests;
- **Alfred University (USA)** – Studies on physical and chemical properties of various AR coatings and thin films;
- **Leibniz Universität Hannover (Germany)** – Energy saving greenhouse¹⁴⁴.

¹⁴⁰ https://ub-cooperation.eu/pdf/cases/E_Case_Study_GroGlass.pdf

¹⁴¹ https://ub-cooperation.eu/pdf/cases/E_Case_Study_GroGlass.pdf

¹⁴² https://ub-cooperation.eu/pdf/cases/E_Case_Study_GroGlass.pdf

¹⁴³ https://ub-cooperation.eu/pdf/cases/E_Case_Study_GroGlass.pdf

¹⁴⁴ <https://www.groglass.com/about/cooperation/>

4.2.5 Center for Innovative Craftsmanship Techwise Twente

<i>Country</i>	The Netherlands	
<i>Name of the university/ VET school + Name(s) of business</i>	Techwise Twente	
<i>Implementation period</i>	2013 - now	
<i>Source of funding</i>	Regional and local government	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input checked="" type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

The Center for Innovative Craftsmanship Techwise Twente is a cooperative association in Twente region, the Netherlands, founded in 2013 as a response to growing demand for highly qualified workers in the sector of High Tech Systems and Materials (HTSM). The Center aims to bridge the gap between businesses and education by organizing demand-driven, state-of-the-art training in the HTSM domains: Mechatronics, Robotics and Vision Systems, Engineering and Production Technology for VET students. The Center associates VET institutions, HEIs, and businesses from the HTSM sector operating in the region and promotes cooperation between them. This cooperation is supported by the Twente Regional Authority, the Province of Overijssel and the Ministry of Education, Culture and Science¹⁴⁵.

The overall aim of the Techwise Twente is “to confront the changing skill needs in the manufacturing industry due to digitization and robotization through VET programmes”¹⁴⁶. An important goal of Techwise is to better coordinate the technical training on labour demand and technological development in the region. Within the Center, entrepreneurs, scientists, teachers, and students work together to promote the quality of education. These public-private partnerships focus on a top sector that is strongly represented in the region. The organization of VET courses, masterclasses, internships and post-graduate courses, as well as curricula development, contributes to the improvement of skills necessary for professionals from the manufacturing sector¹⁴⁷.

Techwise Twente is providing innovative services and added value for companies by operating independently between VET institutions and businesses. Techwise Twente plays an important role in curricula development and delivery and providing opportunities for in-company apprenticeships for students and teachers. Apprenticeships usually involve working with modern, innovative

¹⁴⁵ <https://www.techniekpact.nl/cases/techwise-twente-centrum-voor-innovatief-vakmanschap>

¹⁴⁶ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

¹⁴⁷ <https://www.techniekpact.nl/cases/techwise-twente-centrum-voor-innovatief-vakmanschap>

technologies that cannot be learned in the classroom. Techwise also supports study visits of VET students in the HTMS sector to companies and institutes in the region¹⁴⁸.

Techwise also supports continual VET and lifelong learning, as the majority of its education partners provide education for current workers and enable them to work with innovative technologies either in VET institutions or through apprenticeships at other companies which work with such technologies¹⁴⁹.

Alongside the added value produced within the HTMS sector, this sectoral cooperation has a significant impact on quality of VET and its attractiveness.

4.2.6 Coop Food School

<i>Country</i>	Denmark	
<i>Name of the university/ VET school + Name(s) of business</i>	Coop retail chain Zealand Business College (ZBC)	
<i>Implementation period</i>	2016 - now	
<i>Source of funding</i>	Private and public funding	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Coop is one of the largest retail chains in Denmark with more than 1 200 stores around the country. To face the challenge of missing skilled workforce, the chain established in 2016 its own VET programme for initial VET level for butchers, bakers, delicatessen assistants, sales representatives, managers and office clerks. The programme follows the national requirements for these professions and is implemented in close cooperation with ZBC, an accredited public VET provider. The Coop Food School is a nationally accredited VET programme where students obtain a VET-degree through both apprenticeships (ensured by Coop) and schooling components (ensured by ZBC)¹⁵⁰.

With this new type of education, Coop will annually educate about 100 youngsters for butchers, bakers, and other food-related professionals. Students from each region of Denmark can easily choose the apprenticeship according to their residence and preference. After their successful admission, they will work with professionals from the selected occupation who will teach them the

¹⁴⁸ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

¹⁴⁹ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

¹⁵⁰ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

craftsmanship from scratch. Students will also attend educational courses with other participants in the programme or other students. After graduation, students have a guarantee of apprenticeship in any of Coop store or are welcome to become their full-time employee¹⁵¹.

The Coop Food School has a highly innovative approach to education and training, as well as the admission process. Potential students have to be nominated by schools, advisors or parents. Afterwards, they are “headhunted” by Coop and invited to a “food camp” where they are executing different tasks under the observation of teachers from ZBC and professionals from Coop. These tasks test students’ abilities, motivation, and enthusiasm, not their academic skills. This approach reflects a new VET reform, which requires the young people to have at least grades 02 in Danish and mathematics to enter the vocational schools. The Coop Food School gives a chance to talented youth with lower academic results¹⁵².

After their acceptance, students start their work-based learning component of the Coop Food School instead of starting educational component at the VET school. During the first six months, the programme mixes work-based learning in local Coop shop and educational classes at the Food School. Students attend classes at Food School for 20 weeks in three separate blocks and in between the school, they work at the shop. To improve students’ social skills and professional network, they stay directly at the VET school during the 20 weeks of the educational component¹⁵³.

Currently, the Coop Food School offers 6 apprenticeships: (i) butcher, (ii) baker, (iii) sales trainee, (iv) manager trainee, (v) delicatessen assistants, and (vi) office clerks. The duration of each programme depends on student’s educational background – they can enter the program from 9th or 10th grade already. In general, the programmes last from 2 (as a manager trainee and office clerk) to 4,5 years (bakers or butchers). During the apprenticeship component of the programme, students will receive a salary from the Coop¹⁵⁴.

This project is beneficial for all actors. In general, it increases the attractiveness of VET system in Denmark as well as its quality. The Coop Food Schools gives the opportunity to every talented young person based on their motivation and skills and not on their grades. Students receive relevant hands-on learning by high-profiled teachers and trainers directly from the ZBC and Coop shops. They also have guaranteed apprenticeships or even job offers right after their graduation at one of the Coop shops. This is a mutual benefit for the Coop, too, since through this programme it has ensured highly-qualified workforce in its shops all the time and does not have to face the skills mismatch¹⁵⁵.

4.2.7 Work-based Learning in Bosch

<i>Country</i>	Germany
<i>Name of the university/ VET school + Name(s) of business</i>	Bosch
<i>Implementation period</i>	n/a
<i>Source of funding</i>	Private

¹⁵¹ https://www.food-supply.dk/article/view/238462/coop_abner_egen_madskole_for_bagere_og_slagtere

¹⁵² Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

¹⁵³ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

¹⁵⁴ <http://elev.coop.dk/ansoeg/>

¹⁵⁵ Business cooperation with vocational education and training providers for quality skills and attractive futures. 2017

<p><i>Cooperation category</i></p>	<p><i>Higher Education:</i></p> <p><input type="checkbox"/> Research cooperation</p> <p><input type="checkbox"/> Valorisation of research results</p> <p><input checked="" type="checkbox"/> Cooperation in education</p> <p><input type="checkbox"/> Management cooperation</p> <p><input checked="" type="checkbox"/> Career counselling and alumni work</p>	<p><i>VET:</i></p> <p><input type="checkbox"/> Curricula development or adjustment</p> <p><input checked="" type="checkbox"/> Work-based learning</p> <p><input type="checkbox"/> Sharing resources</p> <p><input type="checkbox"/> Governance</p> <p><input type="checkbox"/> Cooperation in product development</p>
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Narrative description:

Bosch is a global company that operates in a wide range of areas, such as mobile solutions in the areas of hardware, software and service, and development of innovative products and services for industry and craft. However, Bosch is also known for its variety of programmes for students of VET schools and HEIs¹⁵⁶.

Opportunities for VET students:

- **Vocational education** – Bosch offers over 30 apprenticeships in the technical, commercial and IT sectors, to which around 1 500 trainees are recruited every year. Students get an excellent opportunity to work on exciting tasks with professional supervisors and experienced specialists by using the state-of-the-art equipment and contemporary methods. Bosch is also offering students individual stays abroad¹⁵⁷;
- **Internships** – offer students an opportunity to gain insight into the daily work at Bosch and make their first valuable contacts. The internships have various forms: (i) *voluntary internships* – for students who want to gain new knowledge and experience during the holidays. The duration of such internships is usually one week. Students can attend scheduled student vacation seminars where they get to know several professions together with others or the seminars for technical professions where they will work directly with Bosch’s trainers and experts; (ii) *compulsory internships* – tailored to student’s career orientation at schools. Students will get to know technical professions such as electronics technicians, mechatronics technicians, model construction mechanics or materials testers in Bosch’s state-of-the-art training workshops. For each internship, there is an instructor or apprentice who can help students whenever necessary. Students work directly in the area that interests them¹⁵⁸.

Opportunities for HE students:

- **Practice-oriented degree programs** - optimally combine academic and practical knowledge. Students can choose among around 20 different study programmes and models at over 50 locations and around 100 sales branches in Germany. During their study, students will benefit from intensive support from experienced specialists, individual support, and financial support. Students will solve numerous practical assignments in Germany or during their internships abroad. Bosch offers three types of study programmes: (i) *dual study* – a three-year study model with a bachelor’s degree in fields of Arts (such as International Business, Social Work), Engineering (such as Mechatronics, Mechanical Engineering, Industrial Engineering), and Science (such as Computer Science - IT-Automotive, Applied Computer Science). Students study the theoretical content for three

¹⁵⁶ <https://www.bosch.de/>

¹⁵⁷ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/schueler/ausbildung/>

¹⁵⁸ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/schueler/schuelerpraktikum/>

months at a recognized dual University or Vocational Academy and then attend the practical work for Bosch for three months¹⁵⁹; *(ii) cooperative study* – a three to four and a half years programme where students obtain a Bachelor's degree and a working certificate confirming their up-to-date theoretical knowledge and practical experience. There are two Bachelor's programmes available for students – Automotive System Engineering, and Mechanical Engineering¹⁶⁰; *(iii) Study with in-depth practice* – within this variant, students complete their theoretical knowledge through practical phases that are tailored to the contents of studies. They spend a practical semester at the company and complete various internships during the semester break. At the end, they complete the study with a Bachelor thesis. The offered field of study within this variant is Electrical Engineering - Mechatronics¹⁶¹;

- **Internships** – Bosch offers a variety of internships – compulsory, preliminary, voluntary or basic - in Germany or abroad in order to increase students' practical experience for their future work. Duration of each internship is flexible, adapted to student's needs¹⁶²;
- **Practice student activities** – represent a direct participation of a student on a Bosch's projects. These activities will help students to gain knowledge about their future tasks in their job. Students benefit from direct hands-on experience in the project and can already get to know future fields of work that interest them. This is also a great opportunity for them to get a job at Bosch after their graduation¹⁶³;
- **Students@bosch programme** – a special programme for students enrolled in a study programme in the fields of mathematics, technology and/or computer science at a German university who completed an internship or practice at one of Bosch's companies. The relevant department can suggest them for this student programme and after successful selection interview they can enjoy benefits of the programme. Each student has a mentor from a specialist department who gives him/her valuable career tips. Students can also attend various training courses and seminars that significantly increase their knowledge and skills. This programme represents a great opportunity to networking with other participants and within the company, and encourages students to exchange their ideas¹⁶⁴;
- **PreMaster Programme** – through a 12-month intensive on-the-job training, students gain subject-specific practice as well as theoretical knowledge under the mentorship of a Bosch mentor. This programme is structured in two phases: *(i) practical phase in the company* – students will take over tasks in a certain area of expertise, which will be a focus of their Master's programme, in the fields of development, information technology or technical sales. During this phase, students will gain a general introduction to the company and attend at least one relevant specialist seminar. This stage can take up to 12 months; *(ii) study phase at the university* – is built on the first stage and the chosen field of study. Bosch offers students their practical support even during this stage¹⁶⁵.

Bosch also offers for both VET and HE students the opportunity to write their Bachelor, Master or diploma **thesis**. Bosch has many development goals that are a great source for topics for the thesis in many disciplines. Students will work on a topic at the interface to theory and practice by using Bosch's expertise¹⁶⁶.

¹⁵⁹ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/schueler/studium/index-2.html>

¹⁶⁰ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/schueler/studium/index-3.html>

¹⁶¹ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/schueler/studium/index-4.html>

¹⁶² <https://www.bosch.de/karriere/starten-sie-ihre-karriere/studenten/praktikum/>

¹⁶³ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/studenten/praxisstudententaetigkeit/>

¹⁶⁴ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/studenten/studentsbosch/>

¹⁶⁵ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/absolventen/premaster-program/>

¹⁶⁶ <https://www.bosch.de/karriere/starten-sie-ihre-karriere/studenten/wissenschaftliche-abschlussarbeit/>

Experience reports from the Bosch Group

Christopher (24) is currently studying for a dual degree at Bosch Security Systems in Hamburg. In the 2nd year of study, he is studying Industrial Engineering at the DHBW Ravensburg - Campus Friedrichshafen.

"Having previously completed an apprenticeship at Bosch, I was able to gain first-hand information about the dual degree program. After my apprenticeship, I was offered the dual degree program, which supports my goal of later working as a project manager. During my training, it turned out that I am very interested in the mix of commercial and technical activities. Exactly this mixture makes the course so interesting for me.

Through the training and the practical phases of my studies, I was able to work in all areas and departments of the company and thus gained an insight into the work and processes everywhere. This allowed me to gain a comprehensive overview of the interfaces and process flows in the company, which helps me enormously in carrying out my daily work"¹⁶⁷.

Robert (21) is in the 3rd year of his dual study Bachelor of Engineering IT-Automotive at the Robert Bosch GmbH in Stuttgart.

"I became aware of Robert Bosch GmbH through a job portal. After an online application, I was invited to an employment test in Stuttgart-Feuerbach, where I had to prove some fundamentally important skills and knowledge, which are also important later in my studies and work. In addition to tests that have to be completed in individual work, it is also important to be a team player.

During my studies, I have already visited many stations, which students are allowed to choose themselves. After the first year in the training department, where I received some training and was even allowed to carry out smaller projects myself, I already worked on a research project for automotive headlights in Reutlingen and new cloud applications in the area of Connected Vehicle in Waiblingen. I find the variety that the company offers at this point particularly exciting.

As dual students, we are allowed to work throughout the whole Bosch corporation, which means that one can start working on autonomous robots but continue already in a fundamentally different area. Everyone had the opportunity to try things out according to their own preferences and to be able to better assess later in which area they want to work.

The dual study program is a perfect way to complete a degree course within a very short time and at the same time gain a foothold in a company"¹⁶⁸.

4.2.8 VET in HARIBO

<i>Country</i>	Germany
<i>Name of the university/ VET school + Name(s) of business</i>	HARIBO
<i>Implementation period</i>	n/a

¹⁶⁷ <https://www.azubiyo.de/videos-erfahrungsberichte/berichte/bosch-ds-wirtschaftsingenieurwesen-christopher-170720/>

¹⁶⁸ <https://www.azubiyo.de/videos-erfahrungsberichte/berichte/robert-bosch-gmbh-ds-informatik-robert-170607/>

<i>Source of funding</i>	Private	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

HARIBO is a family business founded in 1920 in Bonn, Germany. Today, HARIBO is the world market leader in the fruit gum and licorice segment. Continuous branding under the highest quality control, as well as consumer confidence, make up a large part of the success story at 16 production sites in ten countries worldwide. HARIBO currently employs almost 7 000 people worldwide. For HARIBO, it is extremely important to support young talents and to give them a successful start in the professional world. In order to do that, the company offers VET students interesting internships opportunities¹⁶⁹.

[In the context of this study, HARIBO is an example how professional orientation for finally choosing a profession can be provided as part of a scholar internship programme – all examples presented below reflect the experience of scholars in the phase before leaving for either VET or HE, starting after finishing grade 9, 10 or 12/13 \(Abitur\).](#)

Highly motivated and dedicated students [of the last grade of elementary or VET school](#) can apply for **an internships** at one of the HARIBO subsidiaries. The internship can be completed in the commercial areas only (e.g. financial accounting, human resources, information technology). As there are no fixed student internships in the various departments, the possible internship areas vary, among other things, depending on vacation times or the occupancy of our trainees. In addition, student internships are available at the factory outlet and HARIBO store¹⁷⁰.

~~VET~~ ~~S~~students can choose from *two to three-week internship* in one of HARIBO's commercial departments, *voluntary internships* during school holidays as well as *compulsory student internships* within the context of vocational orientation. After their graduation from ~~a VET~~ school, students can apply for a training at HARIBO, too. Each intern will get a comprehensive supervision during the internship. Interns working in the company headquarters in Bonn can also enjoy free breakfast and lunch in HARIBO's canteen¹⁷¹.

Experience reports from the HARIBO

Matteo L. about his student internship in the IT department:

“My name is Matteo Ludwig, I am 15 years old and visit the Collegium Josephinum in Bonn. In March 2015, I completed a three-week internship in the IT department at HARIBO.

Already in December 2014, I looked for internship opportunities in the internet and came across the internship offer of HARIBO. This immediately inspired me, which is why I sent my application directly

¹⁶⁹ <https://www.haribo.com/deDE/unternehmen/mission.html>
¹⁷⁰ <https://www.haribo.com/deDE/karriere/faq/schuelerpraktikum.html>
¹⁷¹ <https://www.haribo.com/deDE/karriere/praktikum/schuelerpraktikum.html>

to Ms. Paßmann from the Human Resources Department. Just a few days later, I received feedback from HARIBO and was invited to an introductory meeting in Bonn. After a positive conversation, I started my internship in March 2015.

On my first day at work, I was greeted at 9:00 in the lobby and received some organizational information from my supervisor. Then we made our way to the IT department, where I was first introduced to my colleagues. Immediately I was shown my job and was allowed to work directly. My first task was to set up my PC and the Outlook e-mail address.

At 9:30 AM, the entire IT department went into the breakfast break. The great thing was that for interns breakfast and lunch are free. You can also eat as many HARIBO products as you like during working hours.

During the first week, I watched my colleagues and learned a lot, so I was able to help. Later, I was allowed to take on more and more tasks and even fix errors on the hardware alone. In principle there is no difference between interns and permanent employees at HARIBO, you are a part of the team from day one. During my three-week internship, I felt comfortable in the IT department right from the start.

I had my birthday in the third and the last week of my internship, but this day was a normal working day for me. But at HARIBO I was surprised by the whole IT department and everybody congratulated me. I even got a gift and a card, which made me very happy.

Finally, I would like to say about my internship that I have always felt as part of the IT team and have learned and experienced a lot of new things in my internship"¹⁷².

Sophie O.-C. about her student internship in the human resources department:

"HARIBO makes children happy and adults as well" is probably the most memorable slogan I've ever remembered and I am glad that I got the opportunity through a student internship to get an insight into the colourful world of HARIBO.

My name is Sophie, I am 18 years old and am currently attending the Are-Gymnasium in Bad Neuenahr. Since I am going to graduate in the spring of 2016, I would like to see how a working day in such a large company as HARIBO looks like before deciding which direction my professional future should take. I quickly got a commitment and at the end of June, I was able to complete a two-week internship in the human resources department.

On my first day at work, I was warmly received in the foyer and escorted to my office, which I shared with another intern and a former apprentice. After a brief organizational introduction and a tour of the corporate headquarters with my supervisor Lisa Paßmann, I was able to start directly with tasks to be done in everyday working life.

Every day, I was faced with various tasks that allowed me to learn a lot of interesting and new things. On the one hand, there were creative research tasks or the creation of short presentations, on the other hand, I was familiarized with applicant database management and the corresponding aspects for analysing an application. Between my various activities, I had the opportunity again and again to seek the conversation with all the staff members of the department, which were always friendly to me, offered me help and advice or explained to me their respective areas of responsibility.

My goal to gain more clarity about my future career was definitely fulfilled by the internship.

The many conversations I had with staff or apprentices as an industrial clerk, who all told me about their personal experiences, helped me a lot.

¹⁷² <https://www.haribo.com/deDE/karriere/praktikum/schuelerpraktikum.html>

All in all, I can say that an internship at HARIBO is much more than just making coffee and copying and I learned a lot of new things during the two weeks. From the beginning, I felt like part of the team and it took a lot of time to give me the best possible impression of the company”¹⁷³.

Andreas L. about his student internship in finance and accounting:

“Working for the "gold bear" for two weeks means taking personal responsibility instead of copying and making coffee.

That's exactly what my experience was during my student internship at HARIBO. My name is Andreas, I am 17 years old and I am attending the Wirtschaftsgymnasium in Siegburg.

Already during my job interview, I realized that an internship at HARIBO is something special and will bring an interesting experience for me. I found it remarkable how much time has been taken to deal with the motivation and personal interests and inclinations of the applicants.

The first day I was greeted by Lisa Paßmann, Human Resources employee. After a guided tour of the corporate headquarters, where I was introduced to the key areas of HARIBO, I was greeted by the head of finance and accounting, Johannes Erning. Here I was already expected and received a warm welcome.

In conversation with Dr. Erning, I already got a good overview of my activities and the conditions of my work environment.

Just as soon as my application was answered, I was already integrated into the department on the first day of my work as an intern. For all the tasks I had to do, I had a competent contact person for questions at any time.

I found it remarkable that during my internship I was entrusted with the processing and supervision of a special accounting project. The trust placed on my own responsibility as an intern has fascinated me.

The internship at HARIBO was a very rewarding experience for me. I have gained a comprehensive insight into the tasks and activities of the Finance and Accounting department so that my expectations for the internship have been fully met. The practical experience gained was a valuable contribution to me personally and to my future career orientation.

I would like to thank all the employees that I got to know during my internship and who accompanied me professionally”¹⁷⁴.

4.2.9 Volkswagen Dual Academy

<i>Country</i>	Slovak Republic	
<i>Name of the university/ VET school + Name(s) of business</i>	Private Automotive High School Dual Academy Volkswagen Slovakia	
<i>Implementation period</i>	2016 - now	
<i>Source of funding</i>	Private funding	
<i>Cooperation category</i>	Higher Education: <input type="checkbox"/> Research cooperation	VET: <input type="checkbox"/> Curricula development or

¹⁷³ <https://www.haribo.com/deDE/karriere/praktikum/schuelerpraktikum.html>

¹⁷⁴ <https://www.haribo.com/deDE/karriere/praktikum/schuelerpraktikum.html>

	<input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development
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Narrative description:

Volkswagen Slovakia, established in 1991, has a strong position in the economy of the Slovak Republic (in 2016 the company employed more than 12 000 people) and automotive industry as such. Since Volkswagen requires highly qualified workforce, in 2016 the company with other partners (Matador Holding, Siemens and Bratislava Regional Authority) established the Private Automotive High School Dual Academy in Bratislava. The Academy is a unique opportunity for young pupils, who enjoy the technique, and are happy to acquire new knowledge and experience¹⁷⁵.

The dual education system of Volkswagen Slovakia is based on German educational practices, linking theoretical knowledge with practice in the ratio of 3:7. In other words, 30 % of time students spend at the secondary vocational school in order to acquire necessary theoretical knowledge, and 70 % of the time they spend directly on the actual workplace in Volkswagen in order to acquire practical skills and experience¹⁷⁶.

In the Dual Academy as well as in Volkswagen Slovakia, students work with state-of-the-art technologies in the automotive industry in a high-quality working environment. The Academy currently offers study programmes in the following fields: (i) Mechatronics mechanic, (ii) Mechanic electrician, (iii) Mechanic of machinery and equipment, (iv) Adjusting mechanic, and (v) Autotronic¹⁷⁷.

Alongside modern environment and equipment, students benefit from free workwear, possibility to attend a practical training in one of the foreign factories of the Volkswagen Group, transport to the place of education and training with a contribution from Volkswagen Slovakia, food allowance during practical education, and extra pay for productive work. Volkswagen also supports learning of languages, especially English and German, and upon successful completion of the Dual Academy, students will be awarded a certificate of attendance, a diploma certificate and an internationally valid bilingual German certificate of professional competence. Another significant benefit provided by the Dual Academy is a guarantee of a job at Volkswagen Slovakia upon successful completion of the study¹⁷⁸.

4.2.10 L'Atelier Tuffery - Lycée Jean-Baptiste Dumas d'Alès

<i>Country</i>	France
<i>Name of the university/ VET school + Name(s) of business</i>	L'Atelier Tuffery Lycée Jean-Baptiste Dumas d'Alès Plateforme 3D Innov
<i>Implementation period</i>	2016 - 2017

¹⁷⁵ http://sk.volkswagen.sk/sk/pre_uchadzacov/informacie_pre_uchadzacov/dualne-vzdelavanie/dualna_akademia.html

¹⁷⁶ http://sk.volkswagen.sk/sk/pre_uchadzacov/informacie_pre_uchadzacov/dualne-vzdelavanie/dualna_akademia.html

¹⁷⁷ http://sk.volkswagen.sk/sk/pre_uchadzacov/informacie_pre_uchadzacov/dualne-vzdelavanie/dualna_akademia.html

¹⁷⁸ http://sk.volkswagen.sk/sk/pre_uchadzacov/informacie_pre_uchadzacov/dualne-vzdelavanie/dualna_akademia.html

Source of funding	Private and Public funding	
Cooperation category	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input checked="" type="checkbox"/> Cooperation in product development

Narrative description:

3D Innov is a technological platform based in Alès, Occitanie region, France. It is co-financed by the EU¹⁷⁹ and at the same time mobilizes the resources of its partner institutions – regional authorities, private companies, technical vocational high schools (Lycée Jean-Baptiste Dumas; Lycée Polyvalent Albert Einstein; Lycée des Métiers Dhuoda; Lycée Polyvalent Théophile Roussel; Lycée Emile Peytavin de Mendem) and higher education institution (Institut universitaire de technologie Nîmes). One of the main objectives of the platform is to help to align the training of young people with regional economic life based on the premise that the learning process becomes more effective and responsive to the real needs of the labour market through a better access to technological equipment in partner companies. Vice-versa, the platform offers solutions to business demand: after the call of an enterprise, the platform provides tailor-made support, ranging from diagnosis to technology delivery and from networking to outreach. It is specialized in serving small and medium-sized companies wishing to have the best equipment for their specific needs in the following technologies: rapid prototyping by 3D printing, 3D scanning by laser scanner, manufacture by *Stratoconception*, prototype machining with 5-axis digital centre, dimensional control by laser scanner and measuring arm, thermal measurements with infra-red cameras. 3D Innov can develop prototypes, but also small series for the development of new products.

High school of Jean-Baptiste Dumas, based in Alès, Occitanie region, France, is a general and professional studies French college with 2200 students. It was created at the end of the 19th century and it is 3D Innov Technological Platform partner member. Jean-Baptiste Dumas High School plays the card of excellence by joint mobilization of the educational community and the *3D Innov Technological platform*. It allows students to effectively respond to business demand not only as workforce during their training, but also as a driver of innovation and productivity enhancement. It motivates students to learn by doing and at the same time improves the competitiveness of local businesses. An excellent example is the cooperation of a team of teachers and 7 students of *the study programme Design and Realization of Automatic Systems (BTS CRSA)* with *The Atelier Tuffery*.¹⁸⁰

The Atelier Tuffery, the oldest French manufacturer of jeans, suffered from the globalization and the textile crisis until its revival, starting 3 years ago, when *Julien Tuffery*, great-grandson of the founder, implemented a new economic model, without renouncing its territorial roots in the heart of Lozère department. The profound transformation quickly led to results as *Tuff's Jeans* saw their business grow by 600 % in the last 3 years. "*The company has come back to life and exports jeans all over the world*"¹⁸¹, says Julien Tuffery. However, this enterprise situated in the village of Florac,

¹⁷⁹<http://3dinnov.fr/index.php/nos-partenaires/page-builder>

¹⁸⁰<http://www.ac-montpellier.fr/cid118551/partenariat-fructueux-avec-la-plate-forme-technologique-3d-innov-et-le-lycee-jean-baptiste-dumas-d-ales.html>

¹⁸¹<http://www.midinnov.fr/fr/le-concours-des-innovations/les-laureats2017/act-1892-atelier-tuffery/>

needed to improve its productivity. Particularly important was an innovative cutting table, fully automated and ergonomic, which arose from the partnership with the *3D Innov Technological Platform* and the *High School of Jean-Baptiste Dumas d'Alès*. During an entire school year, seven students and their teachers worked to meet the demand of the Tuffery enterprise. They have designed and built an automated cutting table that prevents the tailors of the Atelier Tuffery handling the rolls of denim cloth weighting 90 kilograms.¹⁸² This machine is unique in France.

This work illustrates the importance of a collaboration between the school and the company via technology platforms that help to mobilize the academic knowledge of the higher education institutions, teachers and students in favour of business development.

4.2.11 ABB Training Center GmbH & Co. KG

<i>Country</i>	Germany	
<i>Name of the university/ VET school + Name(s) of business</i>	ABB Training Center (ATC) in Heidelberg Berlin Training Center (AZB) VET schools in Germany	
<i>Implementation period</i>	1927 (as an apprentice workshops of then BBC) - now	
<i>Source of funding</i>	Private funding	
<i>Cooperation category</i>	<i>Higher Education:</i> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<i>VET:</i> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

ABB is the global leader in the field of digital technologies, established in 1988 in Zurich, Switzerland, by merging two European electrical engineering companies – ASEA and BBC. In order to train future professionals, the company offers variety of scholarships, internships, apprenticeships and summer jobs in more than 100 countries around the world. Additionally, two independent training centers were established under the ABB brand – ABB Training Center (ATC) in Heidelberg and the Berlin Training Center (AZB). The Centers provide comprehensive vocational training and dual study and are responsible for the central coordination of the overall process from the selection of applicants to their preparation for the final exam¹⁸³.

Practical training takes place at the respective training location of the applicant. The ABB Training Center (ATC) in Heidelberg is responsible for the central coordination of the applicant process. Together with the ABB training center in Berlin (AZB), it understands itself as a learning enterprise, which teaches modern education contents and methods in order to guarantee a high-quality education at all 27 locations of the German ABB¹⁸⁴.

¹⁸² http://www.emploiir.com/actualites/l-atelier-tuffery-fait-appel-a-la-plateforme-3d-innov-pour-ameliorer-sa-productivite_4077.php

¹⁸³ <http://new.abb.com/de/ueber-uns/abb-training-center>

¹⁸⁴ <http://new.abb.com/de/ueber-uns/abb-training-center>

ABB offers a wide range of excellent engineering and technical (such as electronics technician in variety of fields, industrial mechanic, construction mechanic, mechatronics, surface coaters), commercial (such as specialist for warehouse logistics, industrial clerk, office manager, event manager), and other training (such as chemical laboratory, IT specialists, chef/cook) opportunities¹⁸⁵.

In the first and the second year of study within **the engineering and technical apprenticeships**, trainees are prepared for their professional life by the ABB Training Center and respective vocational school. Students alternate their time in company ensuring practical training and in respective vocational college providing necessary theoretical knowledge. The alternation periods diverse based on the study fields, for instance, in the field of Mechatronics, students spend 2 weeks in company and 1 week in vocational college, while in the field of Electrical Engineering, the alternation is every three months. This phase is completed with the final exam, which represents 40 percent of the final score of the training. In the third and the fourth year of apprenticeship, the trainees switch between practical phases in the respective departments of the company and theoretical phases in the vocational school. At the end of this phase, the final examination will be completed in the form of a company contract. This contributes the remaining 60 percent to the final score¹⁸⁶.

The apprenticeships in the field of **commerce** at ABB also offer in-depth training in theory and practice. The training is organized in the block lessons and modules. The theoretical education in vocational school and practical training in a company are optimally coordinated and change every several weeks. Within the apprenticeship, trainees go through mandatory areas of purchasing, sales, accounting, human resources as well as administrative services¹⁸⁷.

The ABB Training Center is perceiving the traineeships as a long-term investment where quality plays the central role from the very beginning of the process. The process of selection begins with the in-depth screening of all applicants. Selected applicants have to pass an online test, focusing on their skills and knowledge in mathematics, physics, etc. The successful candidates are then invited to take a test directly in the Training Center in order to prove that they conducted the online test by themselves. After that, they are invited to a job interview and are placed at the respective department or the ABB's partner enterprise.

4.2.12 ELA – Polish Graduate Tracking System

<i>Country</i>	Poland
<i>Name of the university/ VET school + Name(s) of business</i>	The Ministry of Science and Higher Education POL-on Social Insurance Institution All HEIs in Poland
<i>Implementation period</i>	2016 - now
<i>Source of funding</i>	Public funds

¹⁸⁵ <http://new.abb.com/de/ueber-uns/abb-training-center/ausbildungsberufe-bei-abb>

¹⁸⁶ <http://new.abb.com/de/ueber-uns/abb-training-center/ausbildungsberufe-bei-abb>

¹⁸⁷ <http://new.abb.com/de/ueber-uns/abb-training-center/ausbildungsberufe-bei-abb>

<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input checked="" type="checkbox"/> Career counselling and alumni work 	<p><i>VET:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development
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Narrative description:

ELA (from Polish *Ekonomiczne Losy Absolwentów* meaning 'Economic Fate of Graduates') is a monitoring system of professional careers of HE graduates, created in 2016 by Polish scientists from the University of Warsaw in cooperation with the Ministry of Science and Higher Education. The system offers (high school) students, their parents, teachers, and other interested parties statistical information on labour market relevance of all HE study programmes in Poland. Anybody can see what is profitable to study in order to earn a good living after graduation¹⁸⁸.

ELA is the only system in the world that generates automatic reports on each field of study of all universities in the country. It collects and presents (in an accessible and factual way) hard data on the economic fate of almost 750 000 Polish universities' graduates to determine how long after graduation they look for a job, how many of them run their own business, how many of them are unemployed, or how much they earn. A significant benefit of ELA is that it shows earnings of graduates compared with the labour market data at the place of their permanent residence. This information shows what standards of living have graduates of respective field of the study achieved¹⁸⁹.

All the necessary data are collected from reliable sources – the **POL-on**, an information system on higher education students and graduates, and the **Social Insurance Institution system**. Automatic analyses have been designed and are supervised by scientists from the University of Warsaw. An important aspect of ELA is full anonymity of persons covered by the study. No personal data are shown in the analysed dataset, and students and graduates are distinguished on the basis of a random number which does not identify individuals¹⁹⁰.

ELA provides the widest possible access to statistical information on professional careers of HE graduates in Poland which enables high school students to make informed decision about their future education and, consequently, career perspectives. Additionally, it enables HEI's staff as well as the Ministry of Science and Higher Education to adapt their activities and policies to the real situation on the labour market¹⁹¹.

¹⁸⁸ <http://www.nauka.gov.pl/aktualnosci-ministerstwo/zobacz-co-studowac-zeby-dobrze-zarabiac.html>

¹⁸⁹ <http://www.nauka.gov.pl/aktualnosci-ministerstwo/zobacz-co-studowac-zeby-dobrze-zarabiac.html>

¹⁹⁰ <http://ela.nauka.gov.pl/en/>

¹⁹¹ <http://ela.nauka.gov.pl/en/>

4.2.13 Baden-Wuerttemberg Cooperative State University

<i>Country</i>	Germany	
<i>Name of the university/ VET school + Name(s) of business</i>	Baden-Wuerttemberg Cooperative State University	
<i>Implementation period</i>	1974 – up to now	
<i>Source of funding</i>	German state budget	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Baden-Wuerttemberg Cooperative State University is the first HEI in Germany which combines on-the-job training and academic studies. The University was established in 1974 as the University of Cooperative Education BA BW (Berufsakademie Baden-Wuerttemberg); in 2009 it was granted the legal status of a university and renamed to its current name. However, the University still continues to carry on the highly successful model of dual education, originally initiated by renowned companies as Robert Bosch, Daimler-Benz and SEL. Each successful graduate is granted a university degree¹⁹².

The University's headquarters are in Stuttgart, but its branches and campuses are located in almost 10 other cities in the German Federal State of Baden-Wuerttemberg. In academic year 2014/2015, the University had almost 34 000 enrolled students, more than 9 000 partner enterprises around Germany, and more than 145 000 graduates which makes it one of the largest HEIs in Baden-Wuerttemberg. The University offers a broad range of undergraduate study programmes in the field of business, engineering, and social work, awarded with 210 ECTS, as well as non-consecutive postgraduate programmes, both with on-the-job training integrated in the curriculum¹⁹³.

The core of the dual programmes is a balanced combination of time spent in classrooms and at the workplace of a partner enterprise. Partner companies are selecting their students and are responsible for the practical part of their studies. This process is based on a three-year contract between the student and the enterprise. Students receive a regular compensation, including social security benefits. During the practical period of the study, students are working on a specific assignments, projects and tasks under the supervision of experienced co-workers. This educational system provides students with necessary knowledge, experience and skills, so upon successful completion of their study they do not need an additional training and are able to find a job in any relevant type of industrial enterprise or in any relevant field of business activity and at various levels of corporate hierarchy¹⁹⁴.

¹⁹² <http://www.dhbw.de/english/dhbw/about-us/history.html>

¹⁹³ <http://www.dhbw.de/english/dhbw/about-us.html>

¹⁹⁴ <http://www.dhbw.de/english/dhbw/cooperative-education-at-dhbw.html>

4.3 Examples from the Central Asia

Good practice from various European countries is complemented by the following examples from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

4.3.1 Nazarbayev University Innovation System

<i>Country</i>	Kazakhstan	
<i>Name of the university/ VET school + Name(s) of business</i>	Nazarbayev University	
<i>Implementation period</i>	2014 - now	
<i>Source of funding</i>	Kazakhstan State Budget	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

An important component of the Nazarbayev University is the Intellectual Innovative Cluster (called also Astana Business Campus) aiming to build ties between the university research and industry and facilitate the transfer of scientific discoveries to the market. In line with the university's 2013 – 2020 strategy, cluster's ambition is to become Kazakhstan's main driver of innovation, leading the way for Astana to become a regional hub of innovation¹⁹⁵.

The cluster has four main components for creation, sharing and commercialization of knowledge:

- **Business Incubator** for young specialists and businessmen that provides consultancy on starting a business; assistance in fundraising; marketing expertise as well as search and attraction of business mentors and business angels (investors) for project teams. In 2016, an acceleration programme ABC Quick Start has been launched. In its first round, 7 teams underwent a training programme, developed their business models and gained access to seed funding. Supported projects encompass a social café for training and employment of disabled staff, clients' database solution for SMEs, 3D metal printer, innovative parcel service, 3D print of peglegs, social network application for selection of gifts and application for kids' education¹⁹⁶.
- **Commercialization Office** provides an opportunity for scientists and workers of the Nazarbayev University to realize their patentable ideas, developments, inventions and projects with high commercial potential at the domestic and foreign markets. Key services of the Commercialisation office include procurement of equipment, consumables and

¹⁹⁵ Nazarbayev University 2013 – 2020 Strategy. Goal V: Innovation and Translating Research into Production

¹⁹⁶ <https://nuris.nu.edu.kz/ru/news-ru/itogi-akseleratsionnoj-programmy-abc-quick-start.html>

services; patenting of intellectual property; assistance in processing of applications for grants; assistance in the promotion of project results to the domestic and foreign markets; distribution of income from the sale of intellectual property rights between the participants of the innovation process in accordance with the university policy; and conclusion of license agreements¹⁹⁷.

- **Technopark** located in the Nazarbayev University campus is a spacious and modern complex of 2,300 square meters for experimental and prototyping purposes and small-scale production based on research results. A variety of facilities is available to be used for research and development in the field of energy; design and manufacture; water technology; medicine, biotechnology and biomedicine; information and communication technologies. One of them is an experimental platform of renewable energy sources, designed to carry out research work in the field of renewable energy sources and their integration with the traditional power grid. In addition, solar power plant SunPower Oasis C-7 with a maximum output of 25 kW/peak operates there¹⁹⁸.
- **A Science Park** is planned to be built on an area of 300,000 square meters adjacent to the university. This ambitious project with an estimated capacity of 8,000 employees aims to attract leading high-tech companies. When the project was announced in 2015, companies like General Electric, Samsung, and Microsoft were said to be willing to join the cluster and a total of about 90 companies were expected in the end¹⁹⁹. According to the Memorandum of Understanding signed in 2014, the Samruk-Kazyna Sovereign Wealth Fund (\$67 billion state-owned holding of enterprises operating in oil, transport and logistics, chemical and nuclear, mining and smelting, energy, mechanical engineering and real estate) will establish a research centre for green technologies, robotics and renewable energy in the Astana Business Campus²⁰⁰. The centre will also implement educational programmes for the executives of affiliated companies, in co-operation with the university.

Astana Business Campus is a part of Kazakhstan's flagship university, tasked by the President with setting a national standard of higher education, combining Kazakhstani identity with the best international educational and scientific practice²⁰¹. Up to now, the university has established the key elements that contribute to this vision and produced some marketable results (patented prototypes of solar water pumping system, patented a new type of lithium-ion batteries and copyrighted interactive advertising showcase²⁰²). The next critical stage will be to generate or attract more companies that will locate activities on site and engage in significant co-operative activities with the research facilities and between themselves²⁰³.

4.3.2 UNIWORK – Strengthening Career Centres in Central Asian HEIs

<i>Country</i>	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
<i>Name of the university/ VET school + Name(s) of business</i>	15 Universities + Career Centres: •EU: Universidad de Alicante (Spain), FH Joanneum (Austria), University of Sheffield (UK)

¹⁹⁷ <http://businesscampus.kz/en/about/ofis-kommertsializatsii.php>

¹⁹⁸ <http://businesscampus.kz/en/about/tekhnopark.php>

¹⁹⁹ OECD Reviews of Innovation Policy: Kazakhstan 2017

²⁰⁰ <https://sk.kz/press-centre/news/5666/?lang=en>

²⁰¹ Nazarbayev University 2013 – 2020 Strategy.

²⁰² <http://businesscampus.kz/en/projects/>

²⁰³ OECD Reviews of Innovation Policy: Kazakhstan 2017

	<ul style="list-style-type: none"> •KZ: New Economic University (Almaty), Kokshetau State University •KG: Bishkek Academy of Finance and Economics, Osh Technological University, Talas State University •TJ: Khujand Polytechnical Institute of Tajik Technical University, Technological University of Tajikistan (Dushanbe) •TU: Turkmen State Institute of Transport and Communication (Ashbagat), Turkmen State Institute of Economics and Management (Ashbagat) •UZ: Tashkent State University of Economics, Samarkand State University, Bukhara State University <p>5 Chambers of Commerce:</p> <ul style="list-style-type: none"> •KZ: Association of Commercial and Industrial Enterprises •KG: Bishkek Business Club •TJ: Chamber of Commerce and Industry of the Rep. of Tajikistan •TU: Turkmenbaha Economic Society •UZ: Chamber of Commerce and Industry of Uzbekistan <p>5 Ministries:</p> <ul style="list-style-type: none"> •KZ: Ministry of Higher Education •KG: Ministry of Education and Science •TJ: Ministry of Higher Education •TU: Ministry of Higher Education •UZ: Ministry of Higher Education 	
<i>Implementation period</i>	01/12/2013 – 30/11/2016	
<i>Source of funding</i>	Project budget 1.359.005€ (90% financed by Tempus IV)	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input checked="" type="checkbox"/> Career counselling and alumni work 	<p><i>VET:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

The purpose of a college is to help students find a career path that will lead to a successful and happy future. In other words, a job. Career Centres have a fundamental role to play in HEIs as a source of information on the transition from the university to the labour market, contributing (i) to orient graduates in the labour market, and (ii) to promote the university's social capital in the world of business, making both systems more attractive to each other. Students who use career services can plan student loan borrowing based on future income, explore career opportunities during and after college and learn how to become the best possible marketable job candidates²⁰⁴.

²⁰⁴ UNIWORK presentation at the 1st Uzbekistan National Forum on Youth Employment and Entrepreneurship, Tashkent, Sept. 26th, 2015

Based on the know-how and experience of Spanish, British and Austrian universities, the UNIWORK project enhanced the capacities of selected Central Asian HEIs in effectively promoting the employability of graduates and entrepreneurship culture amongst students. Establishment of new or enhancement of existing career centres at 12 Central Asian HEIs has been achieved through a variety of activities including:

- Study visits of CA partners to EU Career Centres;
- Training seminars for staff of CA Career Centres;
- Practical placements of CA Career Centre staff in the EU Career Centres;
- Purchase of new equipment;
- Pilot provision of enhanced services by CA Career Centres, including the organisation of trainings for students and graduates, business plan competition for students, employment marathon & matchmaking events, and alumni – student networking events.

At the same time, career centres reinforced their relationships with enterprises and developed tools for their active involvement in students' career counselling:

- Roundtables with local stakeholders;
- National Fora: Youth Employment and Entrepreneurship;
- Regional Forum: Youth Employment and Entrepreneurship;
- Final Project Conference.

The project was implemented by a remarkably broad and complex partnership of universities, ministries and chambers of commerce in all five CA countries. Its outputs include for instance the rebranded Career Centre at Sh. Ualikhanov Kokshetau State University (Kazakhstan), officially inaugurated by the rector on March 17th, 2015. On December 26th, 2015, the Technological University of Tajikistan opened a new 'Centre of Career and Competitiveness Monitoring in the Labour Market' at its branch in Isfara. The project published training materials, conference proceedings and analytical reports, including 'Career Centres in Central Asian HEIs: Current Status & Good Practices' and 'Student Employability and Entrepreneurship in Central Asia'.²⁰⁵

4.3.3 Turin Polytechnic University in Tashkent

<i>Country</i>	Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Turin Polytechnic University in Tashkent	
<i>Implementation period</i>	2009 - now	
<i>Source of funding</i>	Kazakhstan State Budget	
<i>Cooperation category</i>	<i>Higher Education:</i> <input checked="" type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education	<i>VET:</i> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources

²⁰⁵ www.uniwork-project.eu

	<input checked="" type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development
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Narrative description:

Turin Polytechnic University in Tashkent (TPUT) is an Uzbek university founded in 2009 as a cooperation project of Politecnico di Torino (POLITO, the oldest Italian technical university), UZAVTOSANOAT (the leading automotive group in Uzbekistan), General Motors and the Uzbek Ministry of Higher Education. TPUT aims to train qualified engineers in Uzbekistan with the standards of POLITO and to conduct research and development at international level. TPUT also aims at supporting Uzbek industrial development through the creation of entrepreneurial capabilities and the supply of facilities for industrial innovation.

TPUT is independent from POLITO but offers Bachelor's and Master's degree programmes based on POLITO academic programmes. Some courses offered in Tashkent are delivered by POLITO faculty members, while others are taught by TPUT faculty members previously trained by POLITO teachers. POLITO confers its own Bachelor's and Master's degree upon TPUT students on the basis of double degree agreements.

The following courses are currently being offered at TPUT:

- Bachelor's degree programme in Mechanical and Energy Engineering;
- Bachelor's degree programme in Information Technology and Automation Systems in Industry (ICT);
- Bachelor's degree programme in Industrial and Civil Engineering and Architecture;
- Master's degree programme in Mechatronics Engineering.

In academic year 2017/2018, 1075 students were enrolled, which makes TPUT a major science, technology and engineering university in Uzbekistan²⁰⁶.

From the very beginning, TPUT closely cooperates with major engineering companies. Global and regional brands like SIEMENS, General Motors, MAN and Samavto actively cooperate with TPUT in the design and delivery of practical training formats. Agreements with Uzavtosanoat and General Motors–Powertrain enable students visiting production plants and first-hand learning about production and working practices. They also familiarise themselves with on-site management, technical processes, and negotiation techniques in dealing with foreign companies and joint-ventures²⁰⁷. In 2011, a metrology centre has been established in cooperation with the company HEXAGON Metrology. In 2013, SIEMENS opened at TPUT a training centre on its software NX Unigraphics. One year later MAN established a training centre for mechanics and drivers of large trucks.²⁰⁸ TPUT's focus on applied research is underpinned by the on-campus Technopark for Construction and Machine-building.

TPUT operates under the joint management of Uzbek state bodies and industrial companies. Out of the 12 members of the Board of Trustees, 6 persons represent Uzbek Government (including Deputy Prime Minister and Minister of Higher Education) and 6 persons represent Uzbek industry²⁰⁹.

²⁰⁶ https://www.polito.it/international/partnership/politecnico_nel_mondo/uzbekistan/?lang=en

²⁰⁷ <http://uzbek.org.uk/tpiu/>

²⁰⁸ https://polito.uz/index.php?option=com_content&view=article&id=7&Itemid=113&lang=en

²⁰⁹ https://polito.uz/index.php?option=com_content&view=article&id=8&Itemid=114&lang=en

4.3.4 Enterprise-based Learning in Eastern Kazakhstan

<i>Country</i>	Kazakhstan	
<i>Name of the university/ VET school + Name(s) of business</i>	D. Serikbayev East Kazakhstan State Technical University Ust-Kamenogorsk Polytechnical College AES Kilroot Power Ltd.	
<i>Implementation period</i>	2015 - now	
<i>Source of funding</i>	develoPPP.de programme of the German Federal Ministry for Economic Cooperation and Development	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input checked="" type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Since 2013, Kazakhstan has made considerable progress with the introduction of the dual approach to VET. By 2016, about 60% of VET colleges applied the approach fully or applied key elements of it (in particular more enterprise-based learning). 2016 was also a year of legislative change, as the dual approach was introduced into the Law on Education and the labour code. Furthermore, a new education standard was adopted to give flexibility to providers working with the dual approach.²¹⁰

A good example how the dual system is implemented in remote regions of the country can be found in Ust-Kamenogorsk, an important mining and metallurgical centre of Kazakhstan. The cooperation among the energy producer AES Kilroot Power Ltd., D. Serikbayev East Kazakhstan State Technical University and Ust-Kamenogorsk Polytechnical College has been supported by the develoPPP.de programme²¹¹ of the German Federal Ministry for Economic Cooperation and Development.

The partners are working together to align training in the areas of energy efficiency and workplace safety with the needs of Kazakhstan's mining and metalworking industry and other sectors of the economy. The goal is to promote training for specialists and improve the quality of training measures as well as workplace safety standards. The project has developed needs-based, industry-specific training modules and innovative teaching materials and media, including a specialised interactive game about energy efficiency. These training modules were incorporated into the curricula of both educational institutions. To offer training for specialists from a range of industry sectors, AES has also added the topics of energy management and workplace safety to the curriculum of its own in-house training centre. By August 2017, some 240 teachers and experts have completed training in the fields of energy efficiency and workplace safety.

²¹⁰ ETF (2017): Torino Process 2016-17 Central Asia

²¹¹ This development cooperation instrument implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) aims to foster the involvement of private sector in areas where business opportunities and development policy initiatives overlap.

The project won the 2017 annual award of the American Chamber of Commerce (AmCham) for the most innovative education and training project²¹².

4.3.5 Huawei Seeds for the Future Programme

<i>Country</i>	Tajikistan, Turkmenistan, Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Huawei Technologies Co., Ltd. Tashkent University of Information Technologies (Uzbekistan) Turkmenistan University of Transportation and Communication	
<i>Implementation period</i>	2016 - now	
<i>Source of funding</i>	Huawei	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Since 2008, Huawei's flagship corporate social responsibility programme Seeds for the Future seeks to develop local ICT talent, enhance knowledge transfer, promote a greater understanding of and interest in the telecommunications sector, and improve and encourage regional capacity building and participation in the digital community. In each partner country, 10 ICT university students are selected and invited for a two-week study tour to Chinese capital city, Beijing, and the high-tech and manufacturing hub, Shenzhen. They study cutting-edge information and telecommunication technologies at Huawei HQ training centre, practice in labs with real equipment, visit Huawei exhibition halls and observe latest ICT solution demonstrations. In addition to that, they learn Chinese language and culture and visit some tourist attractions.²¹³ Until to the end of 2016, the programme had been implemented in 96 countries and international organizations worldwide, benefiting over 30,000 students from 280 universities.²¹⁴

In Central Asia, Huawei is one of the key players in ICT business. In 2016, Seeds for the Future has been launched in Uzbekistan, based on an agreement between Huawei and the Tashkent University of Information Technologies (TUIT). The first group of TUIT students took part in the Seeds for the Future in 2016. The second cohort of TUIT students travelled to China in May 2017. Together with their fellows from Egypt and Bahrain they achieved the best results and gained the 1st place in training group competitions supervised by Huawei instructors.²¹⁵

Tajikistan launched the Seeds for the Future programme in October 2016 when 10 students from several Tajik ICT universities completed the two-week training in China. As it was the first training

²¹² <https://www.developpp.de/en/news/amcham-award-education-project-kazakhstan>

²¹³ Seeds for the Future brochure: <http://www-file.huawei.com/-/media/CORPORATE/PDF/Sustainability/seeds-for-the-future-v1.pdf>

²¹⁴ <http://www.huawei.com/en/about-huawei/sustainability/win-win-development/social-contribution/seeds-for-the-future>

²¹⁵ <http://www.huawei.com/en/about-huawei/sustainability/win-win-development/social-contribution/seeds-for-the-future/uzbekistan>

project of Tajikistan with a Chinese company, it was officially opened by the representatives of the Ministry of Education of Tajikistan, the Ministry of Foreign Affairs of Tajikistan and the Tajik Embassy in China.

In Turkmenistan, the first round of the Seeds for the Future programme was launched in February 2017. Turkmen Ministry of Telecommunication, Ministry of Transportation and Huawei jointly selected 10 students of the Turkmenistan University of Transportation and Communication who participated in the programme. Upon their return to Turkmenistan, a closing ceremony with cabinet members was held.²¹⁶

4.3.6 Mirzo Ulugbek Innovation Center

<i>Country</i>	Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	All VET + HE + Entrepreneurs	
<i>Implementation period</i>	2017-ongoing	
<i>Source of funding</i>	Government	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

The Mirzo Ulugbek Innovation Center (MUIC) was established in accordance with the Decree of the President of Uzbekistan of June 30, 2017 "On measures to radically improve the conditions for the development of the information technology industry in the country." The main goal of the Innovation Center is to create favourable conditions for the formation and active development of high-tech industries based on the use of ICT and further deepening of the integration of science, education and production in this industry.

According to the Decree, the main activities of the Innovation Center are:

- Creation of organizational, technical and financial-economic conditions for expanding the **interaction of economic entities and higher educational institutions** in the production and sale of information technology products on the domestic and foreign markets;
- Assistance to residents of the Innovation Center in attracting foreign investments for the implementation of competitive ICT projects in the domestic and foreign markets;

²¹⁶ <http://www.huawei.com/en/about-huawei/sustainability/win-win-development/social-contribution/seeds-for-the-future/turkmenistan>

- Participation in providing employment for **graduates of higher educational institutions and professional colleges** in the specialty of "information technologies", including the support to gifted youth in implementing their start-up projects;
- Organization of advanced training and retraining of personnel in the field of ICT through short and medium-term specialized courses, delivered by both national and foreign experts;
- Support to new entrepreneurs in the implementation of innovative ICT projects in perspective directions.

On the 19th of January 2018, the official publication on the MUIC website announced that the resident status was granted to additional 57 legal entities. Thus, currently there are 204 companies registered in MUIC²¹⁷. All of them cooperate with the MUIC, HE, VET and business establishments in Uzbekistan. Many foreign investors visit MUIC in order to seek outsourcing opportunities. In February 2018, the Center was visited by Jan Marsalek, CEO of the Wirecard AG, leading online payment processing company based in Germany²¹⁸.

The highest coordination body of the MUIC is a Coordination Council headed by the Prime Minister of Uzbekistan which again underlines the attention paid to ICT sector by the Uzbek Government.

4.3.7 Business Forum of Uzbekistan – Start-up Support

<i>Country</i>	Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	All VET+ HE establishments + Local Business	
<i>Implementation period</i>	2018 - now	
<i>Source of funding</i>	The programme is implemented in cooperation with the Agency for Science and Technologies within the framework of the CCI and UNDP 'Business Forum of Uzbekistan (Phase - III)' project with the financial support of "Sasol" representative office in Uzbekistan and the Agency for Science and Technologies of the Republic of Uzbekistan.	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input checked="" type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input checked="" type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

²¹⁷ <https://muic.uz/ru/about>

²¹⁸ <https://muic.uz/ru/news/glavnyj-operatsionnyj-direktor-wirecard-jan-marsalek-rassmatrivaet-vozmozhnost-autsorsa-razrabotki-po-v-uzbekistane>

The Chamber of Commerce and Industry of Uzbekistan jointly with the UNDP in Uzbekistan within the framework of the project 'Business Forum of Uzbekistan (Phase-III)' are implementing a program to support start-up initiatives of young people, aimed at involving the younger generation, including VET and HE students and young managers, in the process of developing new advanced technologies for business development.

Project participants benefit from the initiative by having²¹⁹:

- Opportunity to take part in a weeklong basic course on Lean Start-up methodology;
- A roadmap for implementation of the start-up project developed jointly with a supervisor;
- Opportunity to participate in Master classes and consultations of market experts (mentors);
- Support in interviewing target audience, testing unique value proposition and hypothesis;
- Assistance in developing a minimum viable product, testing and getting feedback;
- Opportunity to present a project to potential investors at Demo Day and Innovation Fair.

In mid-July 2017, about 85 teams from all over Uzbekistan have successfully passed preliminary selection and presented their start-up projects to experts. Based on the results of expert evaluations (representatives of business), about 30 best projects received an opportunity to participate in the three-month Youth Start-up Support Programme.

4.3.8 Westminster International University in Tashkent

<i>Country</i>	Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Westminster International University in Tashkent + local business	
<i>Implementation period</i>	2002 - now	
<i>Source of funding</i>	University budget	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input checked="" type="checkbox"/> Management cooperation <input checked="" type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Westminster International University in Tashkent (WIUT) was founded in January 2002 in partnership with the University of Westminster (UK, London) and the UMID Foundation of the first President of the Republic of Uzbekistan. The first study programmes, the Certificate of the

²¹⁹ <http://startup.chamber.uz/eng.php>

International Foundation Studies and the Certificate of Higher Education in Business Administration, were validated by the University of Westminster in London. WIUT is striving to deliver international education to its students and actively engages with local and international businesses in for building links for future employability of graduates, review of its programmes, development of course portfolio.

The following are the results of cooperation with businesses:

Guest lectures:

Every academic year, WIUT attracts a wide range of distinguished speakers. These popular lectures are given by academics and business representatives from various sectors. Through the guest lectures students get familiar with contemporary business challenges from the renown businessmen in Uzbekistan, as well as get to know the ways to address actual challenges. Guest lectures at WIUT are organized as an ad-hoc event, part of the course, short programme, or executive course, providing students both educational and networking opportunities²²⁰. Recent business-oriented guest lectures were:

Lecture topic	Speaker	Date
How to become a successful business woman	The guest of this session was the president of the Association of Business Women of the Republic of Uzbekistan, Ms Gulnora Makhmudova.	02.02.2018
Democracy and rule of law in international law and EU law	Series of lectures by Professor dr. hab. Władysław Czapliński	07.02.2018
Make God laugh by sharing your plans: navigating the future in an uncertain world	Richard West is a senior lecturer at the University of Westminster in marketing and module leader for the undergraduate module "Theory and Practice of Business", and the postgraduate module "Sales Promotion and Management".	06.02.2018
Information Driven Entrepreneurship	Colin Everiss teaches Entrepreneurship and enterprise at the University of Westminster in London. Works also as an active researcher in the Communications and Compunetics Research Group.	05.02.2018
The Law Firm, the Legal Services Market and Law Tech	Dr. Kathrani specialises in Criminal Law, and Public, Constitutional and Administrative Law, and taught at undergraduate, postgraduate and vocational levels.	07.02.2018
Debunking Myths of Investment Banking	Mr. Babur Yusupov was invited to WIUT to conduct a guest lecture on the insights of Investment Banking. Mr. Yusupov has previously worked for 9 years at Deutsche Bank London Capital Markets. He was invited on the behalf of the WIUT Finance Club, which aims to cover the fundamentals of equity valuation, bond pricing and critically analyse the phenomenon of financial decision-making.	12.01.2018

²²⁰ <http://www.wiut.uz/details-menu/item/642-guest-lectures-at-wiut>

Executive courses:

The University is working towards extending its short executive courses programme. While executive courses for businesses people include training, development and innovation programmes, the courses for students aim to enhance their skills, knowledge and employability opportunities. Some of the courses delivered/to be delivered include:

Course Name	Business Involvement	Time/Date
Blockchain	Nitin Kale, University of South California	12.03.2018-15.03.2018
Fundamentals of Currency (FX) Trading – using Bloomberg terminal	The course is designed for finance market traders (FX market), employees of commercial banks, representatives of business enterprises who work with currency transactions.	05.03.2018-07.03.2018

Business events and student engagement

The university strives to diversify its engagement with businesses in order to provide value for both groups of stakeholders: businesses and students. These efforts result in organization of myriad of versatile events with involvement of students, staff and business representatives. The events include competitions, shows, conferences, focus groups, debates, clubs etc. The recent list of events at WIUT is presented below:

Event	Business Involvement	Date
Jessup National Rounds in Uzbekistan	The Philip C. Jessup International Moot Court Competition is an advocacy competition for law students. Teams of law students compete against one another through the presentation of oral and written pleadings to address timely issues of public international law in the context of a hypothetical legal dispute between nations. The Jessup Competition is the world's largest moot court competition. It is also the oldest moot court competition dedicated to international law. It is open to law schools all over the world.	08.02.2018
Uzbekistan women in STEM	Awareness raising campaign to increase the population of female students and workforce in STEM (Science, Technology, Engineering, Math) fields. These monthly events are organized in a form of panel discussions and interviews with interesting speakers. Motivation by sharing success stories of 12 women of Uzbekistan who brilliantly developed their careers in STEM. Brainstorming and discussion on challenges for women career development and education in STEM.	Ongoing
Conference on Development Prospects of Entrepreneurial Activities, Innovative Ideas and Technology in the Republic of Uzbekistan	The conference was organized with Tashkent University of Information Technologies and Inha University in Tashkent. It was initiated by 'Innovative Development Group', a group of most active and talented students with outstanding academic results. Major objectives of the Innovative Development Group are the following: <ul style="list-style-type: none"> To develop students' professional and social skills by organizing monthly conferences, brainstorming and other events with local and international specialists. To reveal talents and provide them with the opportunities to be employed by leading IT companies and governmental 	20.01.2018

	<p>organizations.</p> <ul style="list-style-type: none"> • To analyze world-wide experience including various reforms concerned with innovations and IT. • To organize different events with successful businessmen, governmental officials and representatives of multinational companies located in the Republic of Uzbekistan. <p>After the conference, the most active participants were awarded by AK "Uzbektelekom" and Uzmobility companies.</p>	
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Programme Development

WIUT delivers courses validated by the partner institution in the UK – The University of Westminster. Validation provides WIUT with the unique opportunity to make its courses dynamic and flexible following the guidelines of the UK Quality codes and practices. For the development of new courses and modification of the existing courses WIUT actively engages businesses and students to make sure that graduates of the university possess the graduate attributes required at the labour market. Business representatives have an opportunity to talk to students, comment on the programmes and curriculum, familiarize with the university resources, participate in events and activities held at the university. By engaging businesses, WIUT keeps all programmes up to date with the real time requirements and delivers high quality education to its students.

Social Activities

In addition to business events, WIUT also organises a number of social events for students, business and other stakeholders. These events aim at diversification of student experience, active engagement with the society, provision of networking opportunities, diversifying portfolio of extracurricular activities, raising awareness of social issues, provide opportunities for self-actualization of students, support talented students. Social activities include student conferences, culture days, open days, concerts, clubs, performances, competitions, talent shows, fashion shows, debates, guest speakers, meetings between students and various external stakeholders including representatives of the government, foreign delegations, business representatives etc.

The approach to education delivery and enhancement of student experience has impact on students' employability. WIUT Career Department statistics of 2016/17 show that 84% of graduates got employed within 6 months after graduation. If including the graduates who are not seeking employment due to military service, family circumstances, maternity and others, 93% of alumni can be considered as economically engaged.

4.3.9 Adam University in Bishkek

<i>Country</i>	Kyrgyzstan	
<i>Name of the university/ VET school + Name(s) of business</i>	Adam University Business sector (for example: Senti Financial Company, Ala-Tash LLC, Association of Tour Operators of Kyrgyzstan)	
<i>Implementation period</i>	2008 - now	
<i>Source of funding</i>	Public and private sources	
<i>Cooperation category</i>	<i>Higher Education:</i>	<i>VET:</i> <input type="checkbox"/> Curricula development or

	<input checked="" type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development
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Narrative description:

ADAM University/Bishkek Academy of Finance and Economics (BAFE) is a private higher educational institution, established in 1994 in Bishkek to provide education, research and training on business, finance, economics and tourism for the transition economies of the Central Asia. BAFE currently offers professional education on the following programmes:

- Bachelor: (i) Economics; (ii) Management; (iii) Tourism.
- Master: (i) Masters on Economics; (ii) MBA; (iii) Masters on Ecotourism.
- PhD: (i) Economics; (ii) Management²²¹.

One of the main directions of the strategic development of the Adam University is cooperation with the business environment and governmental bodies. The Adam University actively involves representatives of the business environment and state bodies (e.g. Tax Authority, Financial Police, the National Bank) in development of state educational standards, graduate programs, curriculum adjustments, guest lectures and courses, internships, as well as in the jury at various events (student scientific conferences, business games, competitions of business plans, round tables, etc.).

The main results of the cooperation with private sector and governmental bodies include:

1. Strengthened links with the labour market through research, development of curricula based on labour market requirements, consulting activities from representatives of the business environment (in the field of economics, management, tourism).
2. Consulting support of the business sector representatives to students of the "Enactus BAFE" team when developing business projects at national competitions. The "Enactus BAFE" team in 2012 became the national champion of the Kyrgyz Republic and represented the Kyrgyz Republic in Washington (USA).
3. Organization and delivery of trainings for employees of the Ministry of Economy of the Kyrgyz Republic aimed at strengthening communication, languages and IT competencies.
4. Development of joint study cases for the Adam University and the training center of the Ministry of Finance of the Kyrgyz Republic.
5. Development of the Regional Policy Concept of the Kyrgyz Republic for 2015 - 2020 for the Ministry of Economics of the Kyrgyz Republic.

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4.3.10 Avicenna Tajik State Medical University

<i>Country</i>	Tajikistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Avicenna Tajik State Medical University	
<i>Implementation period</i>	2013 - now	
<i>Source of funding</i>	University budget	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input checked="" type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

The Avicenna Tajik State Medical University (ATSMU) is a Tajikistan public university located in Dushanbe. Established in 1939, ATSMU is considered one of the oldest Medical universities in the world. One of the main components University's Development Strategy for 2017 - 2025 is quality medical service delivery, contributing also to the financial sustainability of the institution.

Under the roof of the ATSMU, a technopark consisting of two diagnostic centres and a central research laboratory, aims to bridge the gap between theory, practical medicine and research.

- **Clinical Diagnostic Center** which is based on the Surgery Department, Internal Disease Department and Medical Consulting Office of the university, delivers a variety of services to the population and annually receives more than 10 000 customers. The specialized departments are engaged into the realization of the activities of the centre with the capacity of 50 staff members. The centre is the most relevant platform for students to be engaged into professional medical service delivery. All the departments of the centre are equipped with modern equipment which allows students to gain experience by using new technology and work with the specialists in the field of their study.
- **Educational - Clinical Dental Center** is dealing with the dental service delivery to the population. Annually the centre receives more than 3000 clients. 3 specialized university's departments of dental care are functioning along with the centre with the capacity of 30 employees. Undergraduate students are engaged into the activities of the centre during dental service delivery under the supervision of senior dentists. These practical activities are allowing the students to be more confident about applying the theoretical knowledge into practice. The centre is equipped with modern dental equipment and the activities are delivered through the usage of a new technology.
- **Central Research Laboratory** aims to deliver a scientific research taking into account the needs of the population. Up to now around 10 patented inventions were discovered through the research conducted in the laboratory. As a science park, the laboratory is equipped with a new modern equipment that allows both scientists and students to research on various topics. Many research projects are being implemented on the grant basis.

Students being engaged into the professional service delivery are able to develop their theoretical, practical and scientific skills that will help them to be competitive at the labour market. For a more effective medical service delivery and for a better education, the university starts B2B marketing towards various business sectors.

4.3.11 Professional Services Lyceum in Khujand

<i>Country</i>	Tajikistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Professional Services Lyceum in Khujand Various enterprises in the Sogd Region of Tajikistan	
<i>Implementation period</i>	2013 - now	
<i>Source of funding</i>	College budget	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input checked="" type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

The main strategic goal of the Professional Services Lyceum (PSL) in Khujand is practical training of young people in collaboration with employers. Based on that, PSL strengthened the cooperation in its main specialties with the following companies from the Sogd Region of Tajikistan:

- The specialty of "Vehicle repairing" - with CJSC "Avtoservis".
- The specialty of "Electricity Equipment Repair" - with the JSC "7 Ganj", the Electricity Network of Khujand, and Electric power station Chkalov.
- The specialty of "Accountant" - with banks "Amonatbank", "Eskhata", and with districts of B. Gafurov, J. Rasulov, Asht, and Konibodom.
- The specialty of "Baker - Culinary" - with the bakery shops "Minutka", "Lazzat", "Angubin", and "Mohitob".
- The specialty of "Cook - Culinary" - with restaurants "Hoshbakhti", "Nasiba", "Kavsar", and "Bahor".
- The specialty of "Hairstyling and Cosmetics Art" - with barbershops "Sabrina", "Muhayyo", and "Nozanin".

The cooperation has various forms:

- Design of the new curricula based on the DACUM method with participation of regional employers and teachers of PSL.
- Joint design of an internship programme for all specialties in the partner companies.

- Professional development of PSL teachers in partner enterprises. Trainings are conducted in CJSC "Avtoservis", bakery shops "Lazzat" and "Angubin" and in the restaurants "Hoshbakhti".
- Participation of employers in final exams. Specialists from enterprises participate in final exams and assess the knowledge of graduates. In the academic year 2016/2017 on the basis of the exams 10 lyceum graduates were employed in restaurants "Hoshbakhti" and CJSC "Avtoservis".
- One classroom was equipped by the CJSC "Avtoservis". Each week the specialist from the company organized master class for teachers and students in this room.

4.3.12 Partnership of a College and Mining Industry in Kostanay Region

<i>Country</i>	Kazakhstan	
<i>Name of the university/ VET school + Name(s) of business</i>	CSE Zhytikara Polytechnical College Joint-stock company "Kostanai minerals"	
<i>Implementation period</i>	2013 - now	
<i>Source of funding</i>	Public and private funding	
<i>Cooperation category</i>	<i>Higher Education:</i> <input type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<i>VET:</i> <input checked="" type="checkbox"/> Curricula development or adjustment <input checked="" type="checkbox"/> Work-based learning <input checked="" type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

Five large deposits of chrysotile asbestos and gold (Kostanai Minerals JSC, Komarov Mining Company LLP, Tokhtar GRP LLP, Brandt LLP, Asbest GRP LLP) are being developed in the Zhitikara District, Kostanay Region, northwest Kazakhstan. CSE "Zhitikara Polytechnical College", founded in 1967, provides the training of personnel for the mining industry of the region since more than 50 years. For JSC "Kostanai Minerals", the CSE "Zhitikara Polytechnical College" has always been the main source of personnel, with almost 40% of employees being trained in this college. However, recent developments in the industry require new graduates: they must be able to find not only competent, but also competitive solutions, to have more vivid human qualities that are quickly revealed in the course of work.

"Professional start" programme implemented jointly by the college and mining industry enterprises allows during the training period to reinforce the theoretical knowledge of the specialty with practical skills obtained in real production conditions. This program consists of events and competitive procedures, during which students have an opportunity to get acquainted with the history and traditions of enterprises, to reveal their creative potential, and the organizers to identify promising, most motivated young people for gaining professional experience and career growth. Students are potential future workers who should not only be well versed in the company's production, but also become familiar with corporate culture and feel comfortable and adapted to

their future colleagues and jobs. Approx. 80% of college students pass professional practice at the enterprises and later 60% of graduates successfully find employment in these companies.

Since 2013, an experimental educational program for dual training has been launched. In the course of work, an algorithm for the practice and employment of students has been developed. During the practice period, students are paid a compensation. In order to ensure safe practice, each student is assigned a leader and a mentor from the enterprise. The execution of work under the guidance of mentors is carried out on the basis of the task assignment. Workplaces of students are provided with the necessary tools and equipment. Special clothing is provided in accordance with the requirements of safety and labour protection.

On October 26, 2017, a meeting of the Board of Directors of Technical and Vocational Education of Kostanay region was held, in which 40 directors of the regional colleges and representatives of the Magnitogorsk State Technical University named after GI Nosov took part. The meeting confirmed successful launch of the dual education in the region and underlined the need for further practical training and internships for teachers and masters in the mining enterprises.

4.3.13 Tashkent Chemical Technology Institute

<i>Country</i>	Uzbekistan	
<i>Name of the university/ VET school + Name(s) of business</i>	Tashkent Chemical Technology Institute Department of Technology of Silicate Materials and Rare Noble Metals	
<i>Implementation period</i>	2010 - now	
<i>Source of funding</i>	Public and private funding	
<i>Cooperation category</i>	<p><i>Higher Education:</i></p> <input checked="" type="checkbox"/> Research cooperation <input type="checkbox"/> Valorisation of research results <input type="checkbox"/> Cooperation in education <input type="checkbox"/> Management cooperation <input type="checkbox"/> Career counselling and alumni work	<p><i>VET:</i></p> <input type="checkbox"/> Curricula development or adjustment <input type="checkbox"/> Work-based learning <input type="checkbox"/> Sharing resources <input type="checkbox"/> Governance <input type="checkbox"/> Cooperation in product development

Narrative description:

During the years of independence, Uzbekistan began to pursue radical reforms in economic and social spheres, including education. As a result of investments in the production sectors of the Uzbek economy, new industries were created in the country, such as automotive, oil, gas and chemistry, modern construction materials, consumer electronics. Those new industries not only increased the efficiency of country's production but also labour productivity. The main qualitative change in the system of higher education is its greater approximation to international standards and creation of favourable conditions for the effective interaction of scientific, educational and production structures.

Tashkent Chemical Technology Institute (TCTI), established in 1991, is considered one of the leading technical HEIs in Uzbekistan. TCTI's Department of Technology of Silicate Materials and Rare Noble Metals (hereinafter 'the Department') is a great example how enabling legislative

environment and progressive HEI management lead to tangible results. The Department created several innovative groups with leading Uzbek companies in glass industry and conducted contractual research according to their needs. As a result, the following industrial achievements have been reported:

- Introduction of a new technology for production of green bottles for different types of beverages in the glass manufacturer "ASL OYNA". More than 1 billion bottles are being produced annually.
- Introduction of a new technology for production of transparent bottles based on local raw materials in the glass manufacturer "ASL OYNA". More than 1 billion bottles are being produced annually.
- Production of ceramic wall and floor tiles based on local raw materials in the "ART GLOSS GALLERY". Annual production reached \$300 mil.
- Introduction of a new technology for production of leaf glass and packaging glass based on local raw materials. Annual production reached \$2 mil.
- 19 brick factories in different regions of Uzbekistan have been constructed upon Department's research on the nature and quality of local raw materials for brick production.

Commercial success of Department's research continuously increased its reputation and attracted new talented staff as well as additional funding. However, the most significant effect of the Department's partnership with business structures is the growth of its graduate employability: from 50% in 2010 to 90% in 2017. According to prof. Mastura Aripova, head of the Department, this remarkable rise of graduates' labour market competitiveness can be attributed to the practical orientation of study programmes, mainly based on cooperation with Uzbek companies.

5 Challenges for Implementation

Case studies from Europe and Central Asia presented in this report revealed a number of challenges for further enhancement of the cooperation between education and business. In addition to that, many issues have been raised and discussed by the participants of the CAEP regional conference "Enhancing cooperation between employers and education institutions in Higher Education and Vocational Education and Training in the European Union and Central Asia countries" held in March 2018 in Warsaw. Authors of the report reviewed all these points and structured them around the different levels of implementation. In the following, a brief overview of these challenges is presented:

The highest intervention level is the **Government**, represented mainly by the Ministry of Education, that is **responsible for creation of an enabling environment** for education and research, a to some extent also for their integration and cooperation with business entities. In Central Asia, many important legal acts have been adopted in the form of presidential decrees. Typical challenges at the governmental level include:

- Lack of systemic motivation, support and initiatives from relevant ministries, i.e. insufficient legal framework and financial resources for research and commercialisation of research results, (inter)national mobility of students and staff, work-based learning, technical equipment in educational institutions, etc. In many countries, educational programmes are rigid and thus do not allow for the necessary degree of flexibility needed for the cooperation with companies driven by the market needs. Both educational institutions and employers face administrative obstacles imposed by different state bodies that reduce their motivation and readiness to cooperate.
- Limited interest/political power to change the environment at HEIs and colleges, particularly the lack of openness to new ideas, concepts, and/or teaching and training methods, keep the systems and structures in universities' and colleges' set up conservative and based upon a traditional and long-standing bureaucratic model.

However, still too many challenges to further development of the cooperation with employers can be found within the **educational institutions**. Many of them do not follow and understand the changing needs of the business world and thus do not adapt their educational programmes and research capacities to their requirements. Usual weaknesses include:

- Lack of internal mechanisms enabling and rewarding the cooperation with business.
- In some countries, the first barrier for cooperation can be the lack of openness and transparency (in terms of educational programmes and their objectives, research topics and results, ongoing projects) of educational institutions towards employers.
- Problems in finding the right, experienced and skilled educators, coaches and/or trainers.
- Lack of experience and/or drive for commercialization of research results.
- Insufficient geographical and research proximity of educational institutions with companies willing to cooperate.

- Insufficient motivation of students to undergo an enterprise-based training. Particularly in VET, the attractiveness of technical programmes is an issue. At the same time, many technical fields of study (such as IT) suffer from huge gender imbalance that again reduce the ability of educational institutions to provide adequate numbers of talented and motivated students.
- Lack of quality education, poor expertise among the teaching and research staff and weak reputation of the educational institution can be a serious factor affecting the interest of companies to cooperate.
- Limited offer of entrepreneurship courses or internships which might have an impact on the effective development of entrepreneurial attitudes and intentions among students. In many cases, the number of HEI's members who are able to teach entrepreneurship is low compared to the entrepreneurial ambition of the HEI.
- Insufficient career counselling services at HEIs and VET institutions result in losing talents and future alumni networks.
- Insufficient tracing of graduates' careers causes missing information on labour market relevance of the study programmes and does not allow for their ongoing enhancement and adaptation.

Representatives of the **business community** often underestimate the cooperation potential with educational institutions and do not actively seek and create collaboration opportunities. They are used to work in a more flexible way than educational institutions and sometimes do not want to face administrative burdens and routine time-consuming procedures:

- With regard to the cooperation in education, the problem often lies in difficult mobilisation of relevant stakeholders – this includes getting business to provide the training part, HEIs to invest into the programme creation and allow flexibility for vocation and work-related training, entrepreneurs to align their needs with the needs of HEIs as well as trade unions and other support organisations.
- Another challenge is to align the different policies and requirements of the stakeholders involved in the cooperation, including how to comply with state regulations and conditions.
- Managing human resources and other capital among partners of cooperation – the most significant area in this case is R&D and the different perception of the utilization of research results – can be another challenge to successful cooperation. Companies prefer to implement its results quietly and under legal protection, while researchers aim to generate scientific publications. Additionally, there is a difference between research needs of partners – companies are usually interested in investing to research areas in which they are facing specific challenges instead of the basic research areas preferred by HEIs.
- Finally, an important challenge is the financial aspect of the cooperation with education. Some companies hesitate in investing into the dual educational programmes that require significant financial resources for in-company trainers, remuneration of students, training machines and material. However, the labour market situation in many European countries implies the need to actively engage in early stage education of potential employees.

6 Recommendations

Challenges for implementation identified in chapter 4 allow formulating several recommendations for stakeholders and decision makers in Europe and Central Asia:

Governments of all countries are advised to pursue their facilitator role in the cooperation between educational institutions and employers. This role includes particularly:

- Creating enabling legal environment;
- Involvement in relevant international platforms and fora, such as the Bologna and Torino process;
- Provision of sufficient funding through various budget lines and competitive grant schemes;
- Supporting internationalisation of HEIs and colleges;
- Delegating maximum degree of freedom, flexibility and responsibility to educational institutions;
- Rewarding the results of quality education, research and labour market responsiveness;
- Increasing attractiveness of VET for potential students, their parents and general public;
- Collection and publication of statistical data on education and its labour market relevance.

Educational institutions are encouraged to comply with basic preconditions for their potential cooperation with enterprises, including particularly:

- Enabling internal procedures for both ad hoc and strategic cooperation with business;
- Creating sufficient financial and other motivation for teachers and researchers who successfully cooperate with business;
- Fostering the culture of openness and welcome for partners from the business world;
- Attracting highly skilled staff members with previous experience in business;
- Providing high quality education and research;
- Actively seeking partnerships with employers, their associations and relevant public institutions – in education, research and governance;
- Establishing supporting structures for research funding and commercialisation of its results;
- Using existing internationalisation opportunities;
- Provision of interdisciplinary entrepreneurship courses and trainings for students;
- Provision of professional career counselling services;
- Application of graduate tracer study mechanisms and alumni work.

Employers should actively exploit the potential of cooperation with HEIs and VET institutions in their geographic and sectoral proximity. They are recommended to:

- Participate in legislative and policy making processes through their unions and associations;
- Invest into the dual education programmes with both HEIs and VET institutions;
- Clearly formulate and present their needs and expectations towards future graduates;
- Actively approach educational institutions with research issues, training requests and offers as well as corporate social responsibility activities.